COAL AGE

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# Jo Brown's Opinion

## How to appreciate the other man's *point of view*

**What we are going to tell about here is happening daily at nearly all mine operations, with this exception: too few managers are as wise in their understanding of human nature as the one in this story**

PAYDAY afternoon at a Southern coal mine. Most of the miners negroes; carefree in disposition, but quick to sense the attitude of employer or clerk as friendly, unfriendly or neutral. As each man received his pay statement, he stepped aside and began—in most cases laboriously—the mental effort of balancing the amount due with his recollection of earnings and stoppages. Most accomplished this to their satisfaction, for the company had the reputation of being careful in its payroll affairs. These joined the long line in front of the paymaster's window. A number, however, could not verify the statements to their satisfaction. These returned to the adjustment window with such remarks as:

"Cap'en, my time's wrong; yo' sho' is done stopped too much on me."

"Boss, I'se in a headin'; yo' ain't got all my coal on dis statement."

JO BROWN was one of these. The clerk verified his statement with the payroll and found it right. He handed it back to Jo, saying, "Go get your money, nigger—that's right." But Jo was not satisfied. Not only did he dislike being called "nigger" so abruptly, but he had forgotten a cash advance of $5; and the clerk, knowing his roll to be right, could not see that Jo had any kick coming. So again he told him to stand out of the way. But Jo didn't get out of the way. He stood there studying his statement, a black picture of sullen grief, trying now and then to address the clerk again but receiving no attention.

Right here my manager friend, who had me in tow, arrived.

"What's the trouble, Jo?" he asked.

"A whole lot, Mr. Jones. I'se short-changed $5."

"Let's see your statement," said my friend. "Dan," he called to the clerk inside, "let's see the order Jo signed for this cash advance."

The clerk soon produced it, and the manager showed it to Jo and asked if he didn't remember getting it.

"Yes, sir, I 'members it now," said Jo; "but dat man just told me his payroll was right, and he ain't never showed me nuthin'."

"Well, you be in the hole Monday and make that $5 back," said my friend.

"Yes, sir, I sho' will," smiled Jo as he made for the paymaster.

"You're a good trouble adjuster," I said to my manager friend as we walked away.

"No," he replied, "it isn't that. I'm no better than Dan or any other mine clerk could be if they would only learn something I learned a good many years ago, and what, I fancy, a good many men fail to see."

"What's that?" I asked.

"Simply this: *It's the easiest thing in the world for every one else to feel that Jo Brown can't have a complaint that amounts to much; but Jo Brown can't understand why everybody else in the world can't see that his complaint is the biggest thing on the map.*

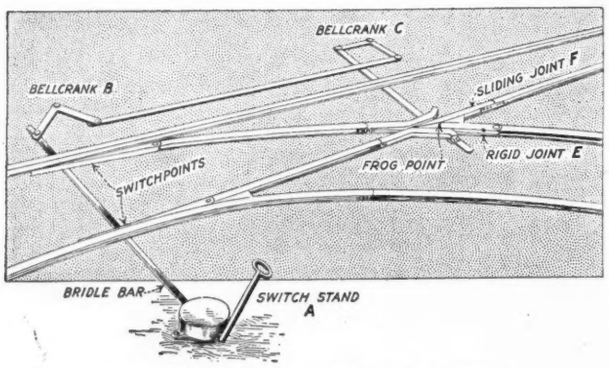
"And in this, Jo Brown is only human. I find I like my own opinions best. Don't you? So whenever I find a Jo Brown I first consider his viewpoint and adjust his troubles from that angle. He thinks I'm a wonder simply because I'm an exception and therefore something new to him, and his troubles are soon over."

*I left my manager friend that day with his treatment of Jo Brown uppermost in my mind. I wish I could pass his viewpoint of individual troubles to every mine manager in the business; for don't you think it would pay if all of us—miners and managers—could learn to appreciate Jo Brown's point of view?*

# IDEAS AND SUGGESTIONS

## Movable-Point Frog

At those mines and collieries where loose wheels are used on the mine cars, difficulty is sometimes experienced through the wheels climbing the frog at switches and derailing the car or trip. In such cases a guard rail at the frog is not always effective, since the loose wheels




DETAILS OF A MOVABLE-POINT FROG

sometimes have considerable play on the axles. To overcome this an auxiliary frog point is sometimes used. This may be placed either side up and on either side of the fixed-frog point to suit the throw of the switch

VIEW OF A MOVABLE POINT FROG INSTALLATION

points, and when so placed completely fills the space between the frog point and the adjacent rail.

To obviate this difficulty, George Thomas, outside superintendent at the Plymouth No. 5 breaker of the Delaware and Hudson Coal Co., has devised and installed a type of switch wherein the point of the frog moves from side to side in conjunction with the switch points. This frog needs no guard rail.

As may be seen in the accompanying drawing, this switch is not materially different from the ordinary type. Motion is transmitted from the ordinary switch stand *A* through a suitable elongated bridle bar to the bell crank *B;* thence through an adjustible tubular rod to the bell crank *C* and thence to the frog point *D.* The frog point is pivoted at *E,* while the opposite prong of the point is free to slide sufficiently at *F* in the fishplates attaching it to the rail to allow the point to move from side to side.

This switch has been in operation for some time and thus far has given entire satisfaction. It is not complicated and can be built at any ordinary mine shop.

## Now Is the Time for Repairs

BY N. H. SEABURG
Boston, Mass.

The public is being advised by the Fuel Administration to stock during the summer months as much coal as it can in order to insure against a repetition of last year's fuel famine. Although it is a well-known fact that the mines are not producing the necessary amount of coal that the current year demands, there is another feature of the problem that is being somewhat slighted, probably for the reason that there seems no immediate solution for it. This is transportation, a factor which is equally important with the mining of coal, in that no matter how much coal is produced it is of no value to the distant consumer unless it can be delivered to him.

The country depends upon the railroads to move the coal that is mined, either to tidewater or other destination, and as it is hoped this tonnage will be increased over last year's, it is evident that the railroads have been assigned a tremendous task. Taxed as they were the past winter to move that season's tonnage, they are nevertheless expected to move much more this year, with practically no addition to rolling stock or even repairs to present equipment.

The strain put upon the coal-carrying equipment last winter was unusually severe, and there has been no letup since then to allow of making the necessary repairs, except when there has been an actual breakdown. This, of course, is bad policy, and amounts to the avoidance of a temporary halt in the transportation of coal through inviting a serious tie-up, when there must come a general car and locomotive shortage. Our present course of action is plunging us headlong into such a contingency and it is folly to delude ourselves into the belief that we can tax our present rolling stock as we are doing without incurring disaster.

It is indeed time to call in the doctor. Looking after the present without thought of the future should not be the attitude of the Fuel Administration. Its desire to have the public stock up during the summer months is excellent, but to do so at the expense of the Nation's

transportation system is questionable expediency. The interdependence of production and distribution is so great that the breakdown of the one means the breakdown of the other. There is little wisdom in crippling, perhaps beyond repair, the entire rolling stock of the railroads in order to stock up coal during the next few months of the year. The trifling gain to be achieved thereby would be more than offset by the injury to the cars and locomotives this effort would possibly cause.

In order to secure the greatest efficiency from the present equipment, which is highly essential on account of the difficulty in obtaining new material, it would seem a matter of prudence to repair and overhaul immediately every defective car and locomotive in the Nation's transportation system, even though this may seriously hamper the movement of freight for a month or more. Cars and locomotives cannot be expected to last forever without attention. If repairs are neglected, there is only one alternative—the scrap heap.

Shall we wait until our equipment is ready to be scrapped before making repairs? Then, indeed, we are rushing headlong into a danger which cannot be adequately pictured. Let us not wait and call in the doctor when it is too late. Let us rather awake to our danger and take the necessary steps to remedy our ills, so that the doctor will not be required.

Of course, this will entail some inconvenience, but this is far preferable to attending a funeral. Optimism, beguiled by a false sense of patriotism, should not blind us to the great difficulties ahead which must be overcome.

# Saving Materials—A Way to Victory

By NEILL HUTCHINGS
Mobile, Ala.

THIS is a war of resources. Germany will be defeated with materials. Coal, iron, steel and allied products will turn the scale of victory in our favor. Every business in America must come to realize that it can only be patriotic by using materials carefully. It is the same with the individual. In fact, "slackers" are already of two kinds: the person who won't fight and the person who won't give up the use of luxuries.

The demand for materials for war purposes is almost past all comprehension. The appetite of war for materials is voracious. If, as the editor of *Coal Age* recently set forth in an article on "War as an Industry" in the *Saturday Evening Post*, it required 9,000,000 tons of coal to produce and transport the million and a half tons of shells used at Verdun in a six-months' period, how can any patriotic coal miner or mine management fail to visualize the task ahead of the coal industry! It is no secret that the Government needs for steel for war purposes will consume the entire make of steel in this country. Neither is it a secret that it takes iron ore and coal to make steel. Every barrage fire laid down on the German lines in France has in it some of the coal mined by the very miner who reads these words.

Finally, the war will be carried into Germany. There will never be a stopping point this side of the Rhine once the scene is reversed and the Allies are pushing the Germans back. But the Rhine will never be crossed on German-made bridges. The materials for that crossing will come in large measure from the mines and mills of America. The road to Berlin must be paved with millions of tons of materials produced and saved in America for this job.

There's the real point. If everybody were permitted to use materials as they have been accustomed to, there might not be enough to pave that road to Berlin. So we have got to save as well as produce. Are you, Mr. Business Man of America, Mr. Mine Manager and Superintendent, using materials with an eye to the needs of your sons and comrades in France? Have you eliminated all the wasteful practices in your business since the war started in order there would be more oil, coal, foodstuffs, etc., for the man in France? Do you still grease your mine cars so that your tipple is caked with oil and ready to burn at the touch of a match, which means wasting the material it would take to replace it? Are you permitting rockfalls to bury good mine timbers, rails, ties, etc., when the right practice would avoid them. You say you are not—but are you sure? It's up to you to know.

Do you—whether you are the miner or the manager—do a lot of things without regard to the needs of your country for materials? If you do, you are getting dangerously close to "slacker" ground. In fact, the individual or the company that hasn't yet come to know that what one man wastes counts big in the present scheme of things is nothing short of a slacker.

Remember: If it takes a small forest to build a wooden ship, or the output of a good-sized mine for a month to build a steel vessel, can you fail to see what slack production or leaks in the use of material means?

Don't forget, too, you can waste material by simply being careless about it. Fire, breakage, improper handling and all the rest mean wasted material. There ought to be a fire inspector on top of every job of any size in this country right now, and an expert to show green men how to handle and use materials properly. Nothing should be wasted that might be saved. If you are a wise manager and a patriotic man, you will make a trip of inspection yourself to see that nothing in the way of materials is wasted and that everything that is humanly possible is done to increase your output.

Above all, keep in mind the road to victory. Remember it must be built of materials we make and save at home. Shall a single boy die in France because his countrymen—whether coal miners, mine managers or what-not—failed to make or save the material that would have saved him?

Let's pave the road to victory with the materials we can save from waste. Can any honest American want to do less? Let's carry on with the war by saving materials.

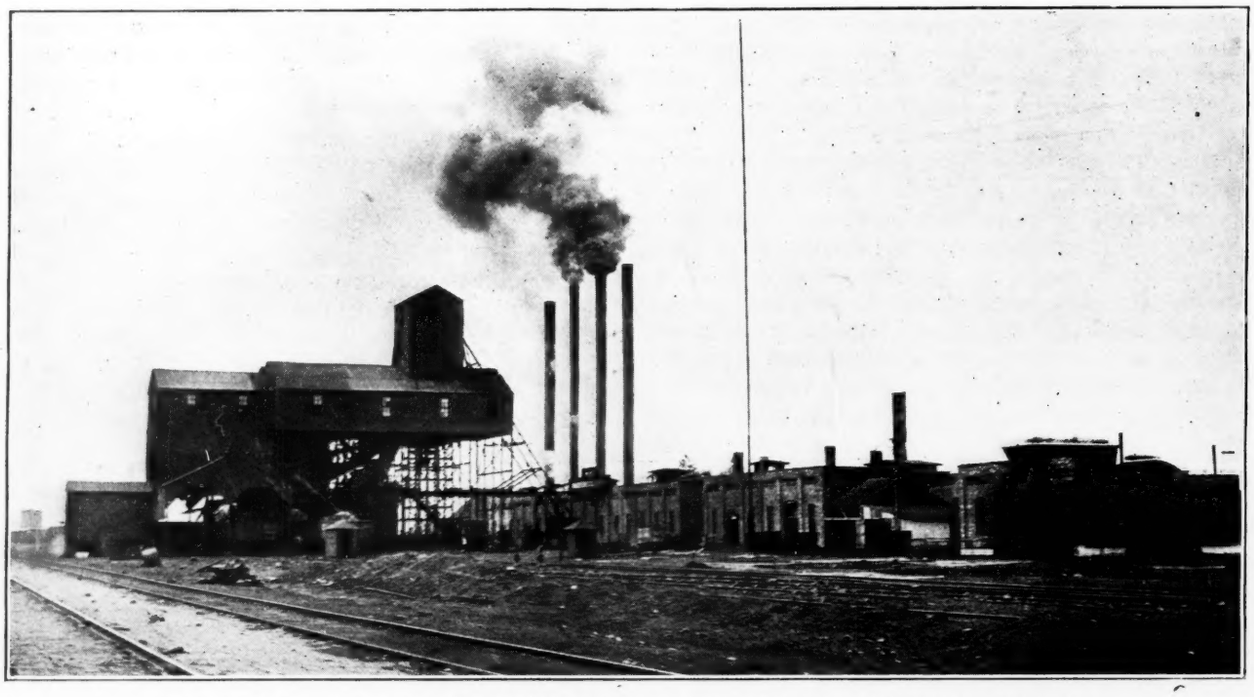


FIG. 1. NO. 6 PLANT OF THE MADISON COAL CORPORATION AT DIVERNON, ILLINOIS

# Model Safety-First Coal Mine in Central Illinois

THE president of the Madison Coal Corporation of Illinois, A. J. Moorshead, has made a most careful analysis of the dangers attending those engaged in the mining and handling of coal preparatory to shipment. He also ascertained the percentage of the accidents in each class to the total number of accidents. This interesting information produced results, as it incited the official in question to action looking to the practical betterment of conditions in and around the mines of his company. Among others the No. 6 mine of the Madison Coal Corporation is literally bristling with safety devices—it is nearly as foolproof a plant as is met with in the coal fields.

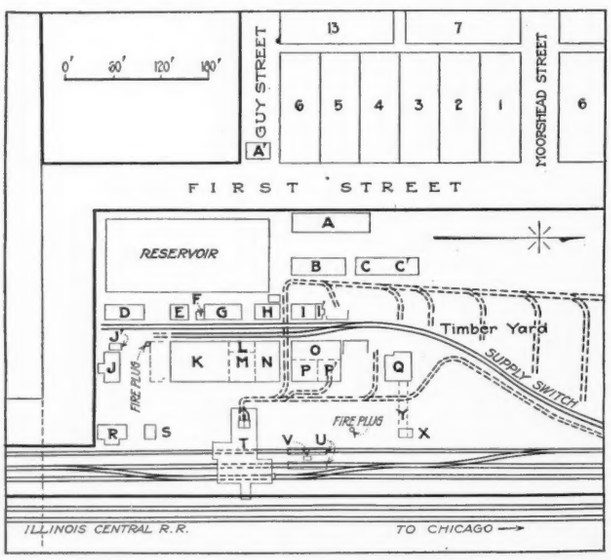



FIG. 2. PLAT OF SURFACE FEATURES OF NO. 6 PLANT OF MADISON COAL CORPORATION

The following buildings are noted: A, Washhouse; B, Lumber Warehouse; C, Cap-piece house; C¹, Masonry storehouse; D, Forage house; E, Oilhouse; F, Supply clerk's office; G, Supply house; H, Coke house; I, Lumber supply; I¹, Bosses' washhouse; J, Office; J¹, Wagon scale; K, Boiler house; L, Pump room; M, Hoisting-engine room; N, Generator room; O, Machine shop; P and P¹, Blacksmith shop; Q, Fan; R, Rescue station; S, Haulage-engine house; T, Tipple; U, Scales; V, Scale house; Y, Tunnel fan to air shaft; X, Air shaft.

Mine No. 6 of the Madison Coal Corporation is on the outskirts of the town of Divernon, Ill. It is in the Springfield district of Sangamon County, on the line of the Illinois Central R.R. In going about the plant and the town adjacent one is impressed with the neat and orderly appearance of the premises. This is in line with all well-regulated business; waste is avoided, workmen are apt to be more careful and efficient, and the appearance of a plant certainly counts for something—generally in dollars and cents.

A general view of the surface plant of the operation in question is shown in Fig. 1. A detail plat of mine and yard buildings is given in Fig. 2; the material of each building is concrete, brick or steel—fireproof construction throughout being employed in the main. The north side of the tipple is shown in Fig. 3 and the south view in Fig. 4. In Fig. 5 the longitudinal elevation of the tipple is given, on which are located the chutes, screens and other coal-handling machinery. The tipple steelwork was erected some time ago (in 1900) by the Kenwood Bridge Co., of Chicago, Ill. A straight three-track screening outfit was installed. A self-dumping cage, made by the Dunkin Foundry and Machine Co., of Alton, Ill., dumps the run-of-mine coal into a

weigh basket, or hopper, from which it goes to the shaking screens. Ordinarily, run-of-mine coal is shipped from this mine; but six sizes can be made with the combination of the shakers and the circular screen. The latter screen is over the bin shown at the south side of the tipple in Fig. 4. Near the dump an opening can be utilized in the main screen when wagon and boiler coal are desired. The wagon dump is shown at the base of the bin in Fig. 4, and the screenings from this dump go to the boilers. In the scale room at the tipple coal is weighed as each car is dumped, and coal is weighed again when loaded on railroad cars for shipment. These scales were made by the St. Louis Scale Co., of St. Louis, Mo. The Illinois Central R.R. uses run-of-mine coal from this plant and sometimes screenings are taken out for a pumping station in connection with the plant. If coal is to be rescreened it is elevated and run through the circular screen which makes the smaller sizes—1¼ in. down.

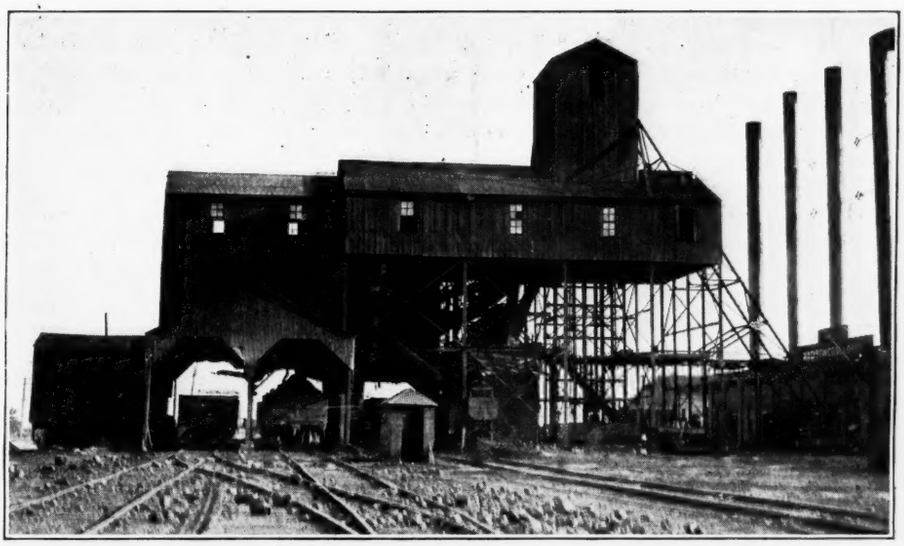


FIG. 3. NORTH VIEW OF NO. 6 TIPPLE AT DIVERNON

On the plat of the surface features, Fig. 2, is shown a reservoir which has been found entirely inadequate for the requirements of dry spells. Its capacity does not permit of the storage of sufficient water to carry the plant over seasons of drought. A large, new reservoir is being made just west of the old one to hold 12,000,000 gal. of water, at a depth of 11 to 12 ft. The creek nearby will supply water for the new reservoir, which will be filled and kept as a reserve supply.

West of the tipple is the boiler, engine and generator house. Steam is generated in eight 72-in. by 22-ft. boilers; six of these were furnished by Rhone & Sons, of St. Louis, Mo., and two by the Brownell Boiler Co., of Dayton, Ohio. The boilers are hand-fired. The 26 x 36-in. first-motion hoisting engine was made by the Litchfield Foundry and Machine Co., of Litchfield, Ill. The hoisting rope is 1⅜-in. steel and is stowed on two 8-ft. drums. The engine is equipped with a steam brake and steam reverse; also a Nicholson engine stop, manufactured by the Vulcan Iron Works, of Wilkes-Barre, Pennsylvania.

In connection with hoisting, mention should be made of the "humble hooks," an English device, of which the Macomber & White Rope Co., Kenosha, Wis., is the American agent. These hooks are locally termed "Johnny Bulls." One is kept as a reserve, and there has not been an overwind with serious consequences since they have been installed. However, the cage has been hung up several times, on which occasions the only practical damage done was a hole in the tipple roof, made by the end of the hoisting rope when it pulled over the sheave. The hooks consist of heavy steel plates and the device is about 2 ft. long and 8 in. or so wide. It is the connection between the rope socket and the cage chains, to which it is attached, by clevises. In case of an overwind, the humble hooks pass through a hole in a 1¼-in. horizontal steel plate; just enough clearance is allowed to pass the upper end of the hook; at the lower end a lug projects out at each side. The lugs are pivoted, so that as the lower ends are forced in by the plate the upper ends fly out, releasing the rope socket clevis. As the cage drops, the upper ends of the lugs settle on the horizontal plate and stop further downward movement of the cage. Back of the engine room are two 12 x 8 x 12-in. steam pumps made by the Hooker Steam Pump Co., of St.

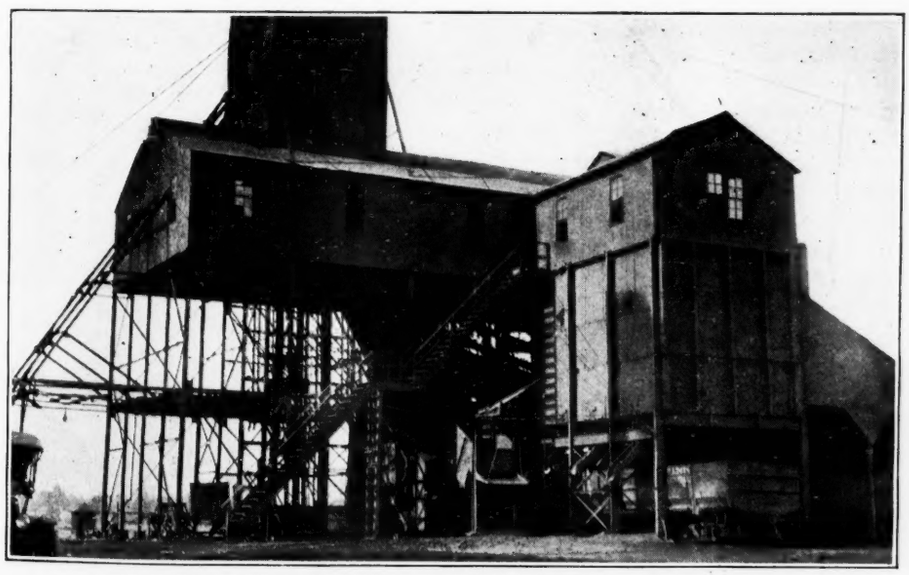
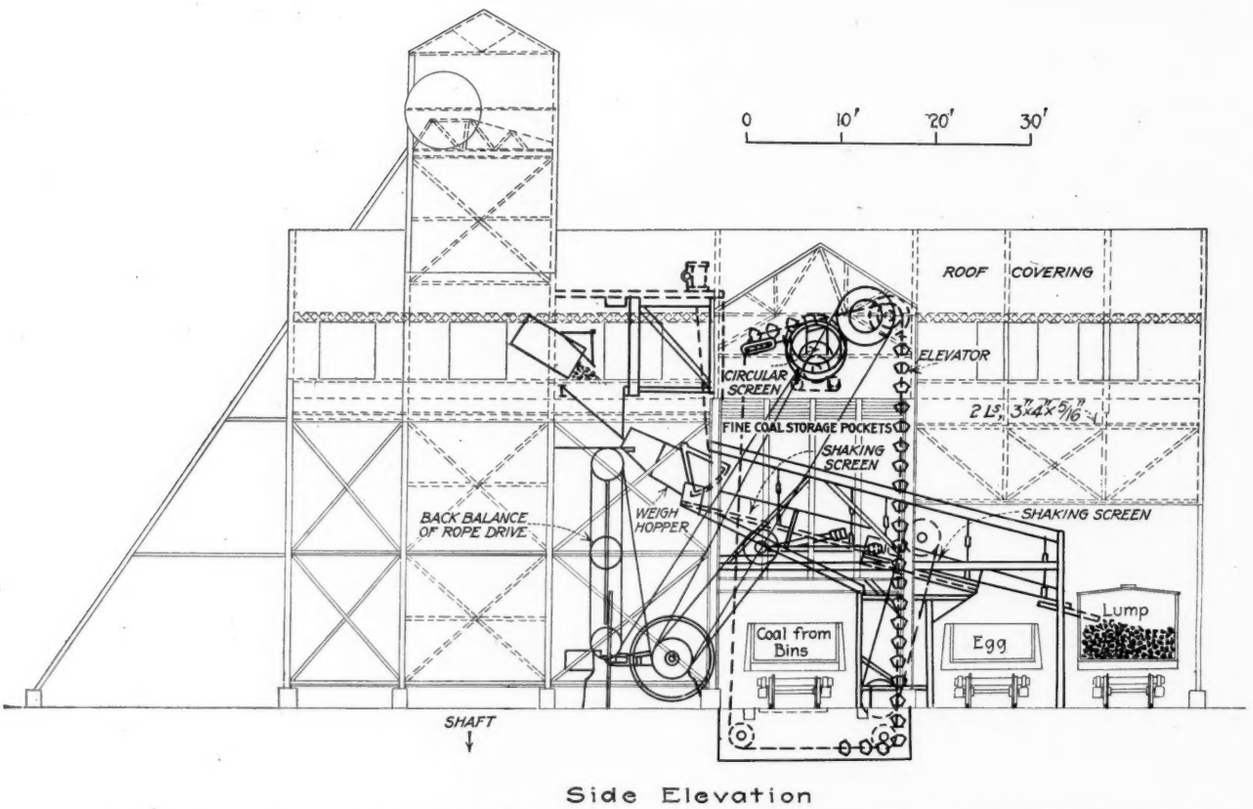


FIG. 4. SOUTH VIEW OF NO. 6 TIPPLE AT DIVERNON



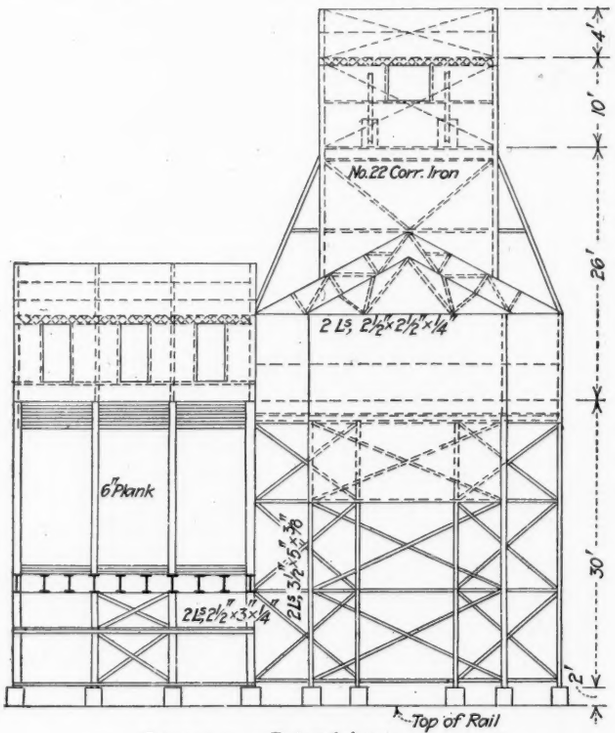

Side Elevation

FIG. 5. SIDE ELEVATION OF NO. 6 TIPPLE OF MADISON COAL CORPORATION, SHOWING LOCATION OF MACHINERY

Louis, Mo. In this room there is also a Cochrane feed-water heater and purifier, made by the Harrison Safety Boiler Works, Philadelphia, Penn. One pump forces cold water into the heater and the other pumps from the heater to the boilers.

Adjoining the engine room on the north is the generator room, in which are three electrical units for furnishing current for power and lights. There is one 100-kw., 250-volt Western Electric Co. generator, one 175-kw., 250-volt General Electric Co. generator and one 100-kw., 220-volt General Electric Co. generator. All are direct-current machines and run by Skinner automatic engines. There is a four-panel switchboard in this room, one panel for each generator, and the fourth panel for the main circuit breaker and the switch for the main line down the shaft.

The machine shop at this plant handles all repair work at the mine, and some other jobs, such as making a lathe for turning wheels and a drill press for the local mine shop. The shop is equipped with a large lathe from J. W. Wright & Co., St. Louis, Mo., and one of medium size made by the Springfield Foundry Co.; a planer from W. C. Johnson & Sons Machinery Co., St. Louis, Mo., a radial drill, Niles Tool Works, Hamilton, Ohio, shear and punch, by New Doly Manufacturing Co., Jeanesville, Wis., shaper, from Smith & Mills Co., Cincinnati, Ohio, and a pipe die machine from Curtis & Curtis, Bridgeport, Conn. A pipe-threading and bolt-cutting machine has been ordered. At the forge in the blacksmith shop adjoining are three steam hammers which are useful in repointing bits for mining machines, among other purposes. A Jeffrey centrifugal 5 x 16-ft. fan ventilates the mine; it is run by a 22 x 24-in. engine made by the Ridgway Dynamo and Engine Co., of Ridgway, Penn. It is run at a normal speed of 90 r.p.m. The fan can be reversed and run exhaust if desired. In the haulage engine house near the tipple is the mechanism for operating the rope system which parallels the empty and loaded railroad tracks




Cross Section

FIG. 5A. CROSS-SECTION OF NO. 6 TIPPLE

and which moves the empty and loaded railroad cars. Each end of the ¾-in. rope is attached to two drums respectively, which are driven by one shaft through friction. There are links on the haulage rope every 250 ft. which permit connection with cars by a short rope. The system is reversible; as the rope winds up on one drum it feeds out from the other.

The employees and their families are well taken care of by the Madison Coal Corporation, which believes that they should have homes and not shacks. A new town adjacent to the plant contains 100 houses which were built by the company at a cost of $1500 each, including a summer kitchen, outbuildings, fences, cistern and

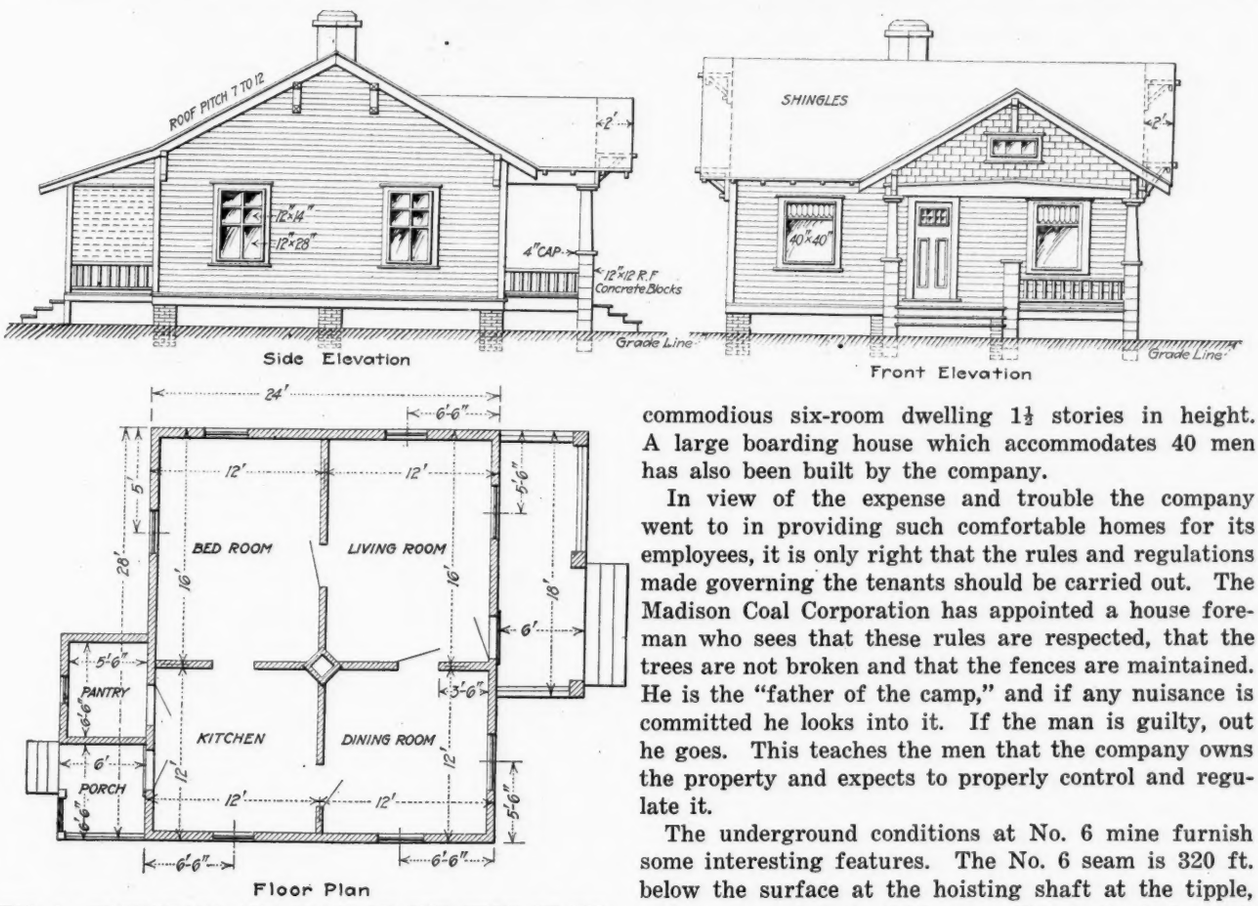



FIG. 6. ELEVATIONS AND PLAN OF ONE TYPE OF EMPLOYEES' HOUSES OF MADISON COAL CORPORATION'S NO. 6 PLANT

other improvements which add to the attractiveness of the town and act as an incentive to the men to keep their places in good shape. The camp at Glen Carbon, another plant of this company, is 30 years old, but the same conditions prevail as to neatness and order. The houses are kept in good repair, attractively painted, and probably are highly appreciated by their occupants.

The mine town at Divernon avoids monotony by having four different types of houses, no two of the same style being adjacent. This feature and the variety in the colors of the paint used on them lend attractiveness to the village. The houses are arranged in four rows, one of which is shown in Fig. 7. Note the neat division fences, the absence of a front fence, the row of shade trees along the street, other trees in the yards and the lawns at each home. Such a scene would do credit to some city suburbs. When the trees fill out in the yards, the village will be still more attractive.

All are four-room houses of the bungalow style and of the dimension and general arrangement shown in Fig. 6. The inside details are about the same for all four types. In the rear of each house is a 10 x 14-ft. summer kitchen and a cistern 6 ft. in diameter and 8 ft. deep. Each house has a lot 150 ft. deep by 50 ft. in width with a 20-ft. lawn in front. Running water is brought close to each house at the division fence, every other side fence having a hydrant which supplies the house on either side. The house occupied by J. H. Miller, the mine manager, is shown in Fig. 8. It is a commodious six-room dwelling 1½ stories in height. A large boarding house which accommodates 40 men has also been built by the company.

In view of the expense and trouble the company went to in providing such comfortable homes for its employees, it is only right that the rules and regulations made governing the tenants should be carried out. The Madison Coal Corporation has appointed a house foreman who sees that these rules are respected, that the trees are not broken and that the fences are maintained. He is the "father of the camp," and if any nuisance is committed he looks into it. If the man is guilty, out he goes. This teaches the men that the company owns the property and expects to properly control and regulate it.

The underground conditions at No. 6 mine furnish some interesting features. The No. 6 seam is 320 ft. below the surface at the hoisting shaft at the tipple, and averages 8 ft. in thickness. This is the bed which produces the greatest tonnage and is the one worked all through the central and southern coal-mining portions of Illinois. The method of mining employed here is the room-and-pillar combined with the panel system. The impurities in the seam include a blue band 2½ ft. from the bottom which runs about 1 in. in thickness. Sulphur bands and balls are also found throughout the coal. The top is generally a clod and black slate occurring from nothing to 8 ft. in thickness. It is full of seams. Above the slate is a solid limestone.

The slate weathers badly at certain times of the year and it is the custom here wherever practicable to leave up about 1 ft. of top coal as protection against this spalling of the top. Props are set with a coal top and crossbars are placed where the coal comes down, especially on entries. On haulageways, if the clod is not more than 2 ft. thick, it is taken down to the inside parting and the entry is timbered from here to the face. At

FIG. 7. EMPLOYEES HOUSES AT DIVERNON

this mine one prop is used for every 10 to 12 tons of coal mined.

No pillars are drawn and rooms are turned off on 60-ft. centers—30-ft. room and 30-ft. pillar. A barrier pillar of 20 ft. is left between the ends of rooms, and there is an entry barrier of 75 to 100 ft. At present one pair of main entries is being driven and eight pair of cross-entries. From the cross-entries, stub entries are driven of an average width of 15 ft.; the main and cross-entries are each about 12 ft. wide. The entries are run on centers, and the assistant mine manager runs the rooms with a compass. Two surveys of the workings are made during the year.

The method of mining employed at the No. 6 mine, in the main, is the one in vogue at a large number of Illinois operations. No attempt is made to extract more coal than can safely be removed without causing subsidence of surface. Also, all coal is taken out on the advance; when all the rooms in a panel are worked to the required distance, then the panel is finished. While it is expected that pillars have been correctly proportioned to opening, and will not fail in the service for which they were left, nevertheless the wisdom of the panel system has been abundantly justified in Illinois. In many instances barrier pillars have limited squeezes to the panel in which the trouble started. A force fan furnishing 130,000 cu.ft. of air per minute ventilates the mine, in which there are eight splits. The overcasts are of concrete and the stoppings are made of slate and old ties plastered with cement and sand. Three mine examiners cover the workings. They find gas occasionally, and the miners stay out of the places in question until the face bosses either brush out the gas or put up a curtain to deflect the air current which removes it. The main or hoisting shaft has two compartments. The air shaft is equipped with a stairway which is partitioned off from the portion used for ventilation. At the bottom of the main shaft is an automatic deflector arranged to be operated by the cage; this device tends to throw coal falling down the shaft away from the bottom men. As the cage approaches the landing, it engages a pawl and moves the deflector into position. Automatic caging devices are installed on the loaded tracks at the shaft bottom. Within a few hundred feet of the bottom of the shaft are a number of interesting features. Between the main and air shafts is an underground room fitted up as a rescue station to give first aid; in it is a first-aid cabinet. In the rear is a small room which is kept hot for special cases requiring such treatment. Nearby, at the air shaft, is a 35-hp. pump of General Electric Co. manufacture; it is figured for a head of 600 feet.

The main entries run east and west from the main shaft, and the tracks are graded so that the loaded cars run to the shaft and the empty ones away from it. At a short distance from the shaft, on the east side, one track is considerably lower than the other one paralleling it. As a safety precaution a pipe hand rail is in position between the two tracks, suspended from the top by brackets. Concrete has not been spared where needed on entries, traveling ways and rooms around and near the hoisting-shaft bottom. Conveniently accessible to the shaft is a waiting room for miners. Seats have been placed on both sides of a traveling way, the sides of which have concrete walls. Whitewash and electric lights contribute to the cheerfulness of the place.

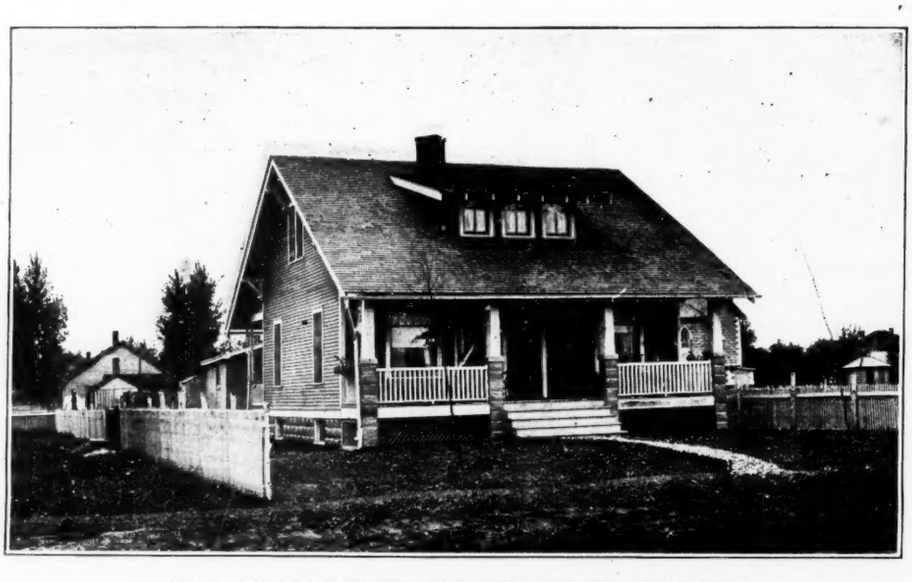


FIG. 8. TYPE OF HOUSE OCCUPIED BY MINE MANAGER

Close to the shaft, also, are accommodations for the motive power for handling cars. A motor barn, with a 2-in. plank floor, has 16 separate switches so that any motor can be taken out without interfering with any other. The main haulage is done by five motors—one 15-ton Morgan Gardner, two 15-ton Jeffrey and two 12-ton Goodman locomotives. Main haulage includes four hauls of about 7000 ft. and five hauls of about 5000 ft. The 15-ton locomotives haul 25 to 30 car trips and prevented from getting together at the bottom. Mechanical gathering is done by four 5½-ton General Electric storage-battery locomotives; the Exide storage batteries used in these locomotives were made by the Electric Storage Battery Co., of Philadelphia, Penn. Additional gathering motors have been ordered.

About 40 mules assist in gathering cars at present, but these "hay burners" will be supplanted by storage-battery motors eventually. Considerable thought was

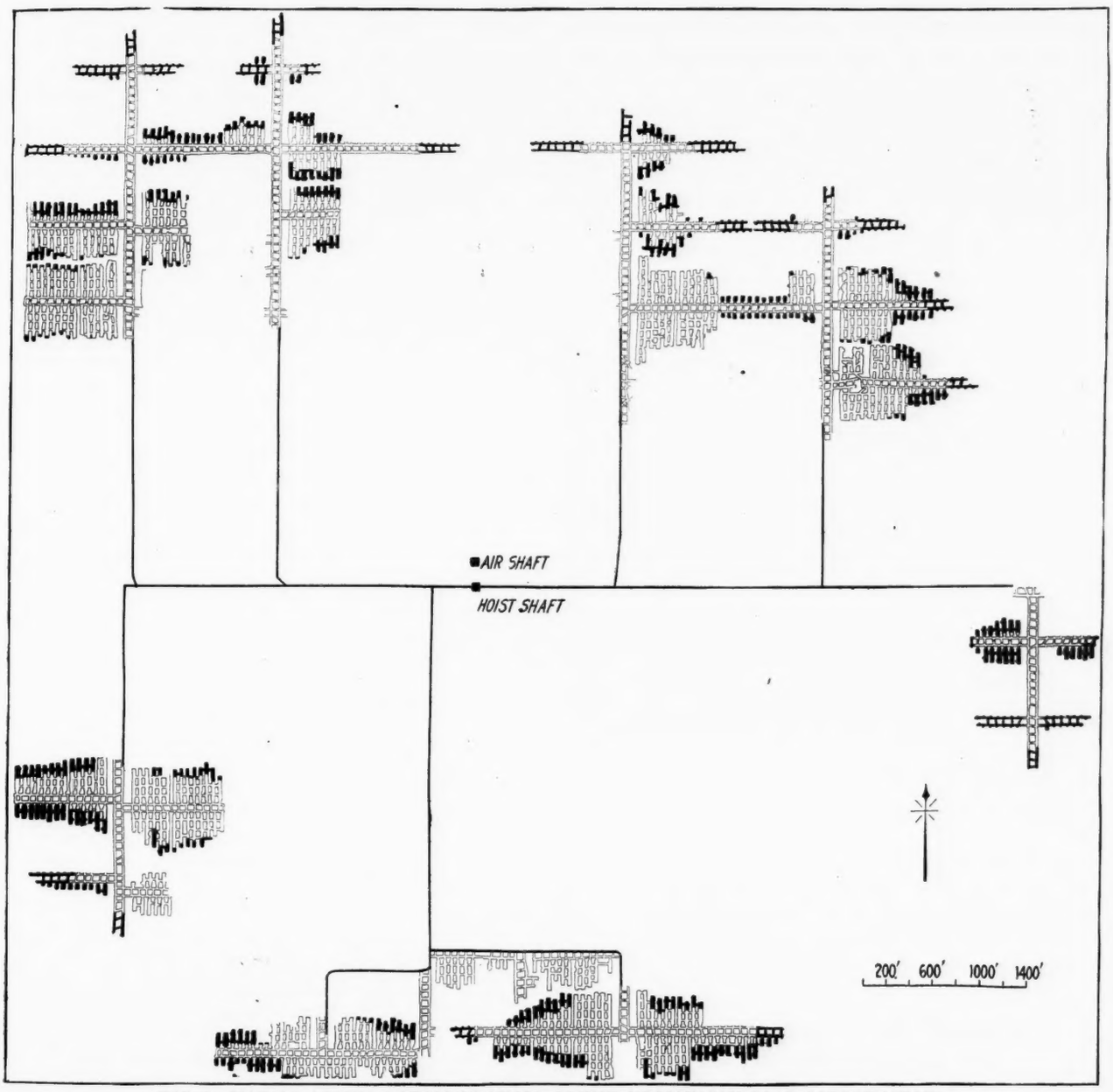



FIG. 9. MAP OF ACTIVE PORTIONS OF NO. 6 MINE OF MADISON COAL CORPORATION

Intermediate territory between the shafts and active portions worked out. The heavy lines leading from the hoist shaft to the active portions of the mine are main haulage roads; main partings are at ends of main haulage roads. Heavy black portions of workings show the last extensions made to mine map on May 5, 1918

the 12-ton motors 20 to 25 cars at a time. There are nine active partings altogether. On the mine map (Fig. 9) the parting is at the end of the main haulage in each case; the main haulage lines are indicated by heavy lines. All partings are lighted by electricity and also haulageways where mules work. On main-entry haulageways, where two or more motors travel, they are protected by a block signal system—also motors are thus given in planning the stable for the mules. Concrete floors, side walls, partitions and mangers are not only of substantial construction but fireproof as well. A sheet-iron feed box is fitted into each manger. The concrete partitions extend from the floor to the level of the top of the manger; above this level the partition consists of iron pipes. An automatic spray system runs the length of the stable both at the back and front of the stalls.

On the opposite side of the shaft from the motor barn is the machine shop; it is a room 18 x 120 ft. in dimension. It is equipped with two overhead cranes with a 2½-ton block. Motors and mining machines are repaired here, armatures wound, etc. The shop is about 375 ft. west of the main shaft.

Nineteen Goodman breast mining machines are available for undercutting at this mine; 14 machines are kept steadily at work, which gives ample opportunity for any necessary attention to the idle machines. The machines undercut to a depth of 7 ft. and 42 in. wide. A double shift is worked on undercutting and 25 cuts are made per shift by each machine, or an average of 2½ rooms. Bits generally have to be set every one to ten runs, but they have been changed four times in one run when the sulphur was particularly bad. The miners, or "loaders" as they are termed in this case, blow the coal and load it.

As this mine is dry and dusty, the water system covering the territory at and adjacent to the main shaft is an important safety precaution. A 2-in. water pipe with hose connections every 40 ft. connects with a water

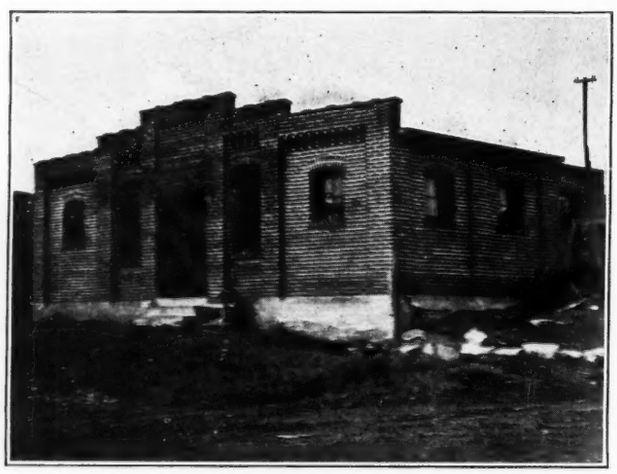


FIG. 10. MINE RESCUE STATION

supply on the surface. A water car regularly sprinkles the main roads on Sundays, and the surplus work of this kind is done at night.

In order to know definitely who enter the mine and whether they leave it again, the following system has been adopted by the Madison Coal Corporation. Before a man goes down the shaft in the morning he leaves a "life check" with the man at the surface cage landing. When all the men have gone down, the checks are sent down and hung up on a board at the end of the miners' waiting room. The inside men get their checks at night and hand them in to the proper party at the bottom cage landing before they go out. If a daily record is kept of those going into and coming out of the mine, it may be valuable evidence on occasion. In some instances, in event of explosions or other mine disasters, it is desirable to have such information correct and quickly available. In normal times it might be a satisfactory arrangement to keep track of individual workers.

An automatic safety-gate device is installed at the main-shaft surface landing. It includes a lock at the gate operated magnetically; also, wires lead from the lock to contacts on the hoisting engine shaft, so arranged that the lock is only released when the cage is at the landing. Two red electric-light bulbs are mounted on the front wall of the engine room in plain sight of the engineer. These flash when the gates are raised at the landing. The engineer can release the lock at any time by a special switch.

Coming out of the mine at night the miners and other inside men resort to the wash-house before going to their homes. The No. 6 wash-house has 572 lockers in all and 30 sprays or showers. At present there are 650 employees at this plant, of which number 602 are inside men and 48 are on top. The various bosses have a separate wash-house with 18 lockers.

The mine is fortunate in having a rescue station on the ground; it is built of cement blocks and is shown in Fig. 10. The large main room in the center is utilized for first-aid work. The injured man is brought here for immediate treatment and the doctor is summoned. In the rear of this room are two small rooms which are used for storage of apparatus. To the left of the building is a bathroom and storage room for clothes. At the right of the building is a gas room in which sulphur is burned during practice times. It is equipped with ladders and the usual apparatus for providing exercise for crews training. The station has four sets of Draeger apparatus, oxygen tanks and other standard equipment.

The officials of the Madison Coal Corporation were most courteous in contributing interesting information and in every way assisting in the preparation of this article, for which favors *Coal Age* is sincerely indebted.

A. J. Moorshead is the president and general manager of the company, G. E. Leyman, general superintendent, and Anton Daenzer, district superintendent. At mine No. 6, Harry Baines is top foreman, J. H. Miller mine manager, and Thomas Bee electrician.

## An Effective Recovery Plant

There has been recently erected at Sheffield, England, a plant for the recovery of metallic particles and other byproducts from furnace fumes. It was discovered about 1906 that by passing gases containing solid dust and minute liquid particles through various forms and types of electrodes, charged with 50,000 to 100,000 volts of current, these dust and liquid particles could be precipitated.

Since that time the inventors of the process, which is of American origin, have not only successfully recovered valuable materials from waste fumes, but have also got rid of smoke and the smoke nuisance. Metals such as zinc, silver, copper, lead and aluminum have been recovered besides coal-tar and other byproducts of commercial value.

The experiments made at Sheffield are yielding satisfactory results, and other firms in Britain are now beginning to install this type of equipment in an encouraging fashion. The British Government has made one installation. The process appears to provide a thoroughly efficient remedy for the smoke nuisance, but the treatment of ordinary carbon fumes is unlikely to prove a profitable proposition. For that reason the installation of the necessary equipment purely as a smoke-abatement device is scarcely within the realm of probability.

# Life and Care of Hoisting Ropes

SYNOPSIS—*Hoisting ropes usually have a modulus of twelve to fourteen million pounds per square inch of wire section. The best Lang lay rope is probably that with six strands of seven wires; it is more flexible than the regular lay and will take shorter bends. Opinions differ as to when ropes should be removed. In the anthracite regions it is the practice to replace them as soon as the stretch is out of them. Ropes should be re-cut and re-coned once every three to six months to prevent undue recurrence of strain at certain points. Reversing of ropes, end for end, is likely to give a false sense of security. Interlocking, locked-coil and galvanized ropes are rarely used in hoisting.*

SOME notes from the discussion of M. H. Sigafoos' paper,[1] read before the mining section at the Sixth Annual Congress of the National Safety Council, are worthy of record here. In general the ropes used for hoisting purposes in the United States have a tensile strength of about 85 or 90 long tons per square inch. The practice among operators of late has been to favor the use of plow steel, which has a tensile strength ranging from 105 to 120 long tons per square inch, but many manufacturers prefer to avoid the use of that material as much as possible because it succumbs sooner to fatigue when wound around a drum, the higher carbon content of the steel being responsible for its more rapid depreciation. Reverse bending, over the sheave and under the drum, injures high-carbon steel much more rapidly than it does low-carbon steel.

### Modulus Should Not Be Assumed Too High

The modulus of 28,000,000 lb. per square inch referred to by H. C. Behr, in his discussion, applied to a square bar. In a wire rope a much different condition has to be considered, as the rope consists of separate wires which work upon each other when the rope passes around a drum or over a sheave, and the compression of the inner wires will take up some of the bending stress—that is, will reduce the modulus. In figuring out bending stresses in ropes, a modulus ranging from about 12,000,000 to 14,000,000 lb. per square inch is used. In using 29,000,000, a bending stress close to the ultimate breaking strain of the rope is obtained, which is not good practice. The wires in a 6-strand, 19-wire rope occupy about 50 per cent. of the area of the cross-section of the rope itself, which will reduce the modulus to some extent. If the 29,500,000-lb. modulus is used in figuring out the bending strength of the $\frac{5}{8}$-in. rope, the ultimate breaking strain of the rope is almost bound to be reached.

About 120 long tons is the highest tensile strength adopted for the material used in flat rope. In the lacing or threading of such ropes a soft wire must be used. This wire accomplishes a twofold purpose: It makes a neater job where the thread is turned back and laced through the different ropes, and it prevents inside abrasion of the wires in the rope itself. The soft annealed wire used as a lacing gets all the abrasion and the strands themselves get little.

Comparative data regarding the length of service given by ropes of regular and Lang lay types, operating under similar conditions, show that at two or three mines where $1\frac{1}{8}$- and $1\frac{1}{4}$-in. ropes are used, the average service of a regular lay rope has been about 24 months. Afterward the Lang lay rope was installed at the mines, and the average service, working under practically identical conditions, has been over 30 months. In one instance the Lang lay rope that was put on gave 34 months' service, as against an average of 24 months of the regular lay. The mines worked every day, and their tonnage outputs were practically the same per day. For this reason the tonnage hoisted in one year may be regarded as about equal to that of the next.

### Wires in Lang Lay Not Laid Tightly

Because of the manner in which the strand is constructed the wires in a Lang lay rope are not laid so tightly as the regular lay. The wearing surface of the wires is much greater, and the wires will stand shorter bends without breaking than will those in a regular-lay rope. The rope is more flexible, and for some purposes gives better service than the regular-lay type. Also, Lang lay rope is less likely to kink, as it will tend to spring out and lay flat. It should be used with both ends fastened firmly, one end to the drum and the other having a closed, and not a swivel, socket. In the early history of Lang lay rope, particularly in the United States, the ropes were quite "twisty"; but now they are made so that they will lay as inert as the regular lay rope. After being in service a short while, they do not give any trouble. A Lang lay rope of 6-strand, 19-wire construction working on a clam-shell digger ran 90 days, as against 25 days of service rendered by a rope of the regular lay, the quality of steel being the same in both.

The Lang lay is undoubtedly the best lay for a hoisting rope, and the best type of Lang lay is a rope with six strands of seven wires in a strand; provided, however, the size of sheaves and the diameter of drums and all other conditions under which it has to work are adapted to a 6 x 7 rope.

The New Jersey Zinc Co. is using such a 6 x 7 rope with good success. The best basis of comparison is not the length of time that a rope has been installed, but the number of foot-tons of work it has performed, because one rope may be lying idle a greater proportion of time than another.

A 6 x 7 rope is more compact than a 6 x 19. The greater number of wires there are in a rope, the greater chance there is for the softening or opening of the strands; and this seems to apply more especially to the Lang lay rope, because the strands and wires are twisted in the same direction, whereas in the regular lay they are twisted in opposite directions. The wires are not so tight in a 6 x 17 or 6 x 19 as they are in a 6 x 7 rope.

[1]Published in "Coal Age," Vol. 12, pp. 928-931, issue of Dec. 1, 1917.

A 1-in., 1⅛-in. or 1¼-in. rope of 6 x 7 construction, with plow-steel wires, is a rather stiff rope, whereas the 6 x 15 or 6 x 17 construction, although not so tight as a regular-lay rope, is less likely to open up or "bird-cage." There is one advantage in the 6 x 19 construction. When a number of the outer wires are broken, there is still a good factor of safety left in the core of the strands, or in the inner wires of the rope, which, in a majority of cases, in 6 x 19 rope constitutes a section having about 40 per cent. of the breaking strain of the rope.

### Remove Ropes When Stretch Is Out

And now as to the proper time to remove and renew a rope: There is a large coal company in the western part of Pennsylvania that uses ropes 1¾ in. and 2 in. in diameter for the purpose of hoisting men, and this company does not remove its rope until the rope shows 50 broken wires in any one foot. There are many people who, not being well acquainted with the construction and breaking strain of ropes, would regard a rope with 50 broken wires in any one foot as dangerous for use in hoisting men, but the Pennsylvania company to which reference is made has never had an accident, and it has found that the rope when tested, after that number of wires has broken, still possesses a large margin of safety. The inspectors on one occasion condemned a rope having these evidences of failure, but the manufacturer claimed that it was still safe. It was thoroughly tested, and it was found that it still retained about 60 per cent. of the original breaking strain.

In the anthracite region operators believe that a good rope is the best insurance of hoisting safety they can have. It is still a question as to when a rope has rendered its service and when it should be removed. A certain company in the anthracite region takes the rope off when the stretch is out, but if the stretch is not out in two years, the rope is removed without regard to that fact. All ropes at these mines are re-coned and re-cut every six months regardless of broken wires. It is an excellent rule to follow. If any broken wires are discovered or reported, that rope comes off at once.

### Utility of Interlocking Ropes

Interlocking ropes have been tried for shaft sinking, with good results, and they are all right for a small load, such as a bucket, and they give good service. One rope that was used in sinking a deep shaft has to date been in use between six and seven years, and it is still in good condition. It is re-coned every six months. The time to take off a rope depends on the nature of its operation and the condition of the rope. Operators differ in their opinions on this matter.

About twelve years ago in the anthracite region a rope broke and dropped 10 men to the bottom of a shaft, killing all of them. The rope had been in operation, according to record, about nine years, and mine officials did not know how much longer. A sample of the rope about 8 ft. back from the fracture was taken and every wire of it tested. The wires in the rope were tested about 3 ft. from the fracture, after they had already been subjected to a breaking strain, and it was found that a tensile pull of 35 tons was required in order to break them.

The engineer claimed that the rope broke while the cage was being lowered, and that he did not know that the rope was broken until the end of it came into the engine room. The engineer was coming to a stop when the rope parted; he knew something had happened, but did not know just what. The men on the rope were supposed to stop at the level, and they were about at that point when the rope broke. The cage had no counterbalance, being a single-hoisting man cage, and was lowered by jerks.

One of the last jerks was at the level, and it is thought that this tug on the rope was the cause of its failure. The rope, no doubt, was able to take care of the load it was supposed to handle, and there must have been an undue strain put upon it; but whatever may have been the cause it was not brought out at the inquest. If the balance of the rope could stand 35 tons after it had already been broken, there must have been more strain than that put on it when it broke. It was pretty well rusted, it is true, but nevertheless, as has been shown, it required considerable strain to break it at a point only 3 ft. from the point of fracture.

The rated capacity of this 1¼-in. rope was 47 tons. Of course, there might have been a much larger amount of corrosion at the break, but that is not probable. It was not known whether the rope was ever dressed or lubricated.

### Re-Cone to Change Points of Recurring Stress

It broke somewhere about 150 ft. above the cage, and there may have been some relation between the position of the break and the position the rope occupied in the sheave when the cage was at the landing. The lower end of the rope was always under tension, as the cage was left hanging with the brake on the drum. When the rope broke, it was at a point coming right under the drum, which was wound with an underbend.

Ropes should preferably be re-cut and re-coned every three months. When three or four feet of rope are removed from the drum end, those spots in the rope where the cage stops have caused permanent damage are shifted and the strain is removed to other parts of the rope.

Reversing a rope will not much increase safety, because most of the breakages have been in the lower end of the rope, showing that it is the lower and not the upper end that is subjected to the greater strain. A writer on the subject has said that in view of results the rope should be tapered the other way. For moderate depths that may be all right, as there is a great margin of safety for a small depth. When the depth becomes great such procedure is dangerous, and care must be taken in regard to the size of the rope, as it is one of the factors of safety.

In an instance where two interlocking ropes were used, one of the ropes ran perfectly, but the other rope "bird-caged,"—that is, opened up—an incident that caused the operators to abandon the interlocking type. Some companies make a practice of reversing the rope. When they have occasion to take the ropes off they frequently change them end for end, on the theory that this practice prevents special strains from continuously acting on any one point in the rope; but this undesirable condition is satisfactorily taken care of by re-cutting and re-coning the end of the rope.

Galvanized hoisting ropes have been little used in this country, as the galvanizing chips off readily in passing over sheaves and drums, and it is then of little or no value. Such ropes are used along the river front in New York City for hoisting on lighters, and here they are more successful. The majority of such ropes as are now in use have been imported. American manufacturers are making few galvanized ropes for hoisting purposes. Galvanizing has some effect on the actual bending strain of the wire itself. The loss in strength varies from 7½ to 10 per cent., according to the size of the wire. Lock coils are rarely used for hoisting purposes, but are popular for tramways and cableways because of the great wearing surface and the readiness with which they are gripped by the over-running carriage.

## Moral Value of Fuel Administering

By J. Crow Taylor
Louisville, Ky.

While sitting in at a conference some time ago between a committee of coal men representing about 40 city dealers and a newly appointed committee on fuel administration which had been named by the state fuel administrator, I went through the sensation of passing from a critical and cynical mood to a feeling of appreciation of the work being done. The final realization was that what is seemingly farcical in this work is in reality excellent in its effect.

The administration committee and the coal committee quizzed each other back and forth in a manner suggestive of efforts at bargain driving on both sides. The coal men wanted to know how much in the way of margin the administration committee had a mind to allow the retail dealers. On the other hand, the chairman of the administration committee confessed that the first question he had planned to ask of the coal men was what margin they desired.

Finally a representative of the Federal Trade Commission who was present and who had participated in the adjustment of retail prices in a number of cities was appealed to for data on the subject, and by reference to his notes information was obtainable with which the two committees might readily have come to an understanding inside of an hour's time, and the matter would have been done and over with.

Moreover, the state fuel administrator by conferring with this member of the Federal Trade Commission or with any well informed man could in a few minutes have set the margin allowance for most of the retailers in the state without any further trouble or ceremony. Instead he had not only named an imposing committee for the city, which was the metropolis of the state, but had named committees for every county in the commonwealth. There are about 120 counties in the state and with from three to four members on each committee, it will easily be understood that their selection and appointment became quite an imposing task, calling for much detail and requiring considerable time and work.

Moreover, the committee appointed to administer the city fuel affairs got up an elaborate questionnaire which was mailed out to the trade. This took several hours' work with the coöperation of the coal committee to even formulate the questions, and has perhaps involved the burning of considerable midnight oil among the coal men in order to comply with the request for information. The trade is fairly familiar with these questionnaires. The amount of work involved seems stupendous, especially in view of the fact that the final result would not in any case bring about any appreciable change in coal prices.

It was the thought of all this that brought the critical cynical feeling. Then another thought came, that of the moral effect, the weight all of this would have in satisfying and establishing public sentiment. The coal trade has suffered in morale, or rather it has suffered in its standing in the public mind because of the increased prices and because of tirades of abuse appearing in the news and editorial columns of the daily papers.

I recalled while this meeting was going on, that following the first conference at Washington between a committee of coal operators and the Government authorities, one of the local papers had railed at the high prices named and had finally termed this meeting a conspiracy rather than a conference. It was perhaps this persistent attitude on the part of some papers that resulted in a succeeding order of lower prices, which later had to be increased again after a thorough examination to satisfy public clamor.

I began to understand why so much elaborate procedure instead of being looked upon as farcical (because an understanding and agreement could have been reached in a few minutes) actually became a momentous matter, of importance in satisfying the public mind that the coal dealers were not robbing them but were serving them fairly and only getting a reasonable profit.

If the committee of coal men and the administration committee had, for example, got together and in a few minutes adjusted the matter of local retail prices, which I am satisfied they could have done, loss of time and much detailed work would have been avoided, work that from a cold business standpoint would seem unnecessary. Yet the necessity for this work is plain if one but views it in the right light—it serves to satisfy the public that it is getting a square deal.

After committees of reputable business men, having the full confidence and respect of the community, go thoroughly into the details of the business and report upon the results, then there can no longer be a question remaining in the public mind of hold-up or conspiracy or unfair dealing. The skirts of the coal men are cleared beyond a question of doubt, and the moral value of this "administering" becomes easily apparent. Moreover, it is a value of considerable moment.

There can no longer be the usual outcry on the part of newspapers, whose editors lacking definite information are naturally clamoring for public welfare—men who assume that because prices are high the people are being held up.

So if one feels inclined to criticize at times and become impatient over the formality, elaborate ceremonies and the mass of detailed work involved in administering fuel, he should stop for a minute and think the matter over. There is a moral value that weighs much, and the coal trade today stands in need of a greater measure of public approval. In the final analysis it will be found that the fuel administering will prove a benefit to the coal dealers as well as a protection to the public.

# Changing from Isolated to Central Station Power

By FRANK HUSKINSON
Lafayette, Colo.

SYNOPSIS—*It was decided to change from isolated station steam-electric power to energy purchased from a central station. After all preparations were completed the shift was made in a few hours without mishap and without a single calculation being found in error.*

AT Sugarite, New Mexico, the St. Louis Rocky Mountain & Pacific Co. operates two mines, with an average daily production of 1000 tons of mine-run coal. The village, tipple, shops and power plant are located in the bottom of Chicorica canyon, with the mines on each side some distance up the mountain. The trips of coal are lowered to the tipple by gravity, a double-drum and heavy steel cables being used on the inclines. The loaded trip pulls the empty cars up. The trips of coal land on the tipple from the mine on opposite sides, the tipple being built across the canyon. Each side of the tipple has its own dump, but the chutes converge, delivering the coal to the railroad

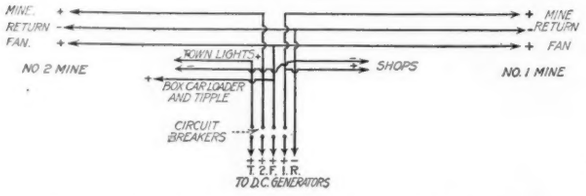



FIG. 1. DIAGRAM OF ORIGINAL POWER HOUSE CONNECTIONS

cars. The trips are hauled from inside the mines to the top of the inclines by electric locomotives.

The steam-electric generating plant located at the tipple furnished direct current at a potential of 500 volts, for the operation of the mine locomotives, ventilating fans, mining machines, pumps, tipple equipment, shops and town lighting system. The power plant equipment consisted of three marine-type boilers and two Ridgway simple, four-valve engines belted to the generators. The switchboard consisted of two feeder panels each with two separate circuits and two generator panels.

The arrangement of all feeder lines leaving the power house before the change to central station power was made is shown in Fig. 1. These consisted of three 4-0 bare copper wires to each mine, and two No. 4 weatherproof wires for the town lighting system. The fans for the mines were on the same circuit. The town lighting system was so arranged as to have two 260-volt lamps in series. The houses for the most part were of four rooms each and this made it necessary to have at least two lamps burning instead of one.

It was decided to put in central station power and have all outside machinery operated by alternating current. Direct current would thus be used only for the underground equipment. At the time of making the change the mines were working full force and every other Sunday, so that it was necessary to arrange to

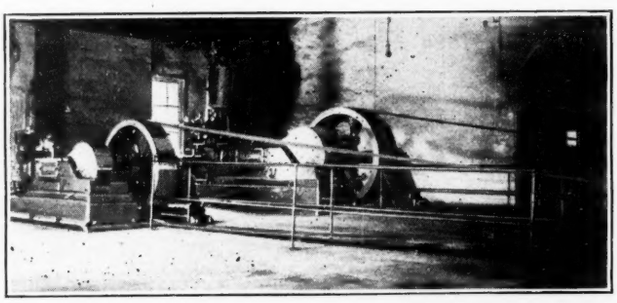


FIG. 2. POWER HOUSE ENGINES BELTED TO GENERATORS

make the change with the least amount of delay possible.

Fig. 2 shows the steam engines in the power plant. Directly in front of these engines the foundations were put in for the large synchronous motors that were to take the place of the engines for driving the generators. A 200- and a 100-kv.-a., 2200-volt, three-phase synchronous motor was placed directly in front of the engines with the pulleys lined up with those of the generators, as shown in Fig. 3. This arrangement did not interfere with the operation of the engines or generators.

The addition of three more panels to the switchboard was made for handling the alternating current—a panel for each synchronous motor and a feeder panel with two three-phase circuits on it. In order to make room for the equipment at the rear of the switchboard it was found necessary to move the original four panels forward a distance of more than 2 ft. This was done without interrupting service, and the three additional panels were then put in and all wiring completed. The three new panels were put in line with the original four, making the seven-panel board which is shown in Fig. 4.

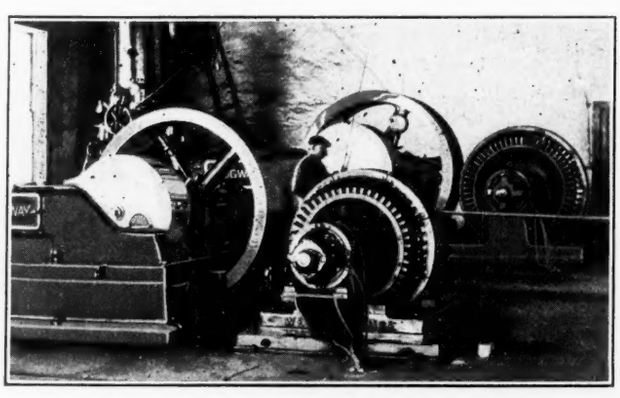


FIG. 3. MOTORS REPLACING ENGINES FOR DRIVING GENERATORS

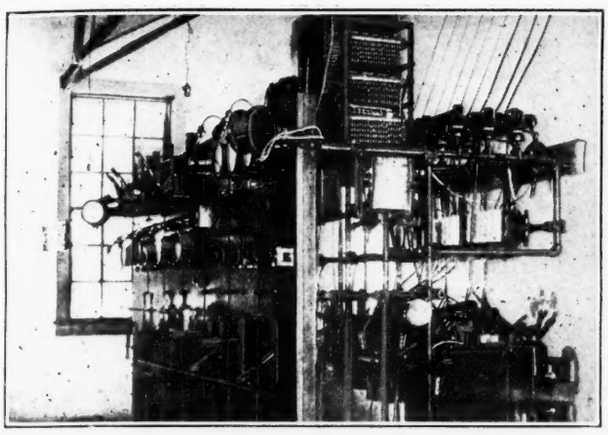


FIG. 4. SWITCHBOARD IN THE SUBSTATION

The three 4-0 bare copper feed wires to each mine were lowered to new cross arms placed on the poles 4 ft. below the top cross arms. Then three No. 6 bare copper wires were put in on the top cross arms from the power plant to each mine fan. A 15-hp., 2200-volt, three-phase induction motor was wired and made ready to be quickly slipped into the place of the old direct-current motor, and arranged so as to use the same belt. This was done at each fan, also a ½-kv.-a. transformer was installed at each fan, reducing the 2200 volts to 110/220 volts for lighting service.

The tipple equipment was run by a 15-hp., direct-current motor. A 20-hp., 2200-volt, three-phase induction motor was wired and made ready to be quickly put in its place, using the same belt. The main well pump was operated by a 15-hp., direct-current motor and also the shops. A duplicate of the fan motors was wired and made ready to be quickly put in, utilizing the same belts, etc.

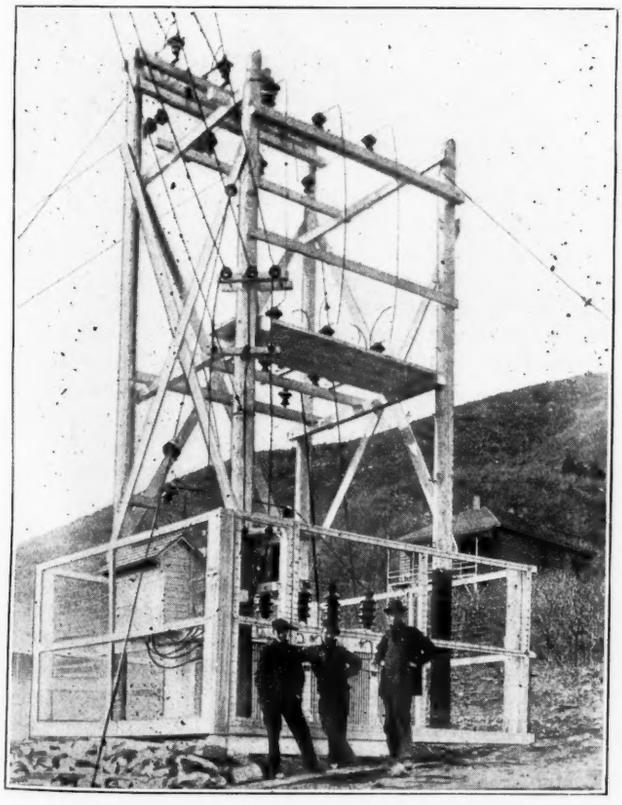


FIG. 5. OUTDOOR TRANSFORMING STATION

A third wire was run with the town lighting wires and five transformers were installed and wired up at different locations in the village and at the shops, reducing the 2200 volts to 110/220 volts for the lighting systems.

The central station power was received from Trinidad, Colo., a distance of about 35 miles. This power was delivered at the transformer tower at a potential of 44,000 volts, but was here stepped down to 2300 volts. The transformer tower was of the outdoor type and is shown in Fig. 5. This tower is only about 100 yd. from the power house. After all the new feeder lines and circuits had been installed the arrangement of lines was as shown in Fig. 6.

When all was in readiness for the change the mine was closed down at noon on Saturday, and by 7 o'clock that evening the generators, mine fans, tipple, shops and town lighting system were working on central station power. The entire system of house lights had to be changed from series to multiple wiring. This was done in three days. For temporary service one lamp socket in each series was plugged with a fuse and this allowed the use of the other socket.

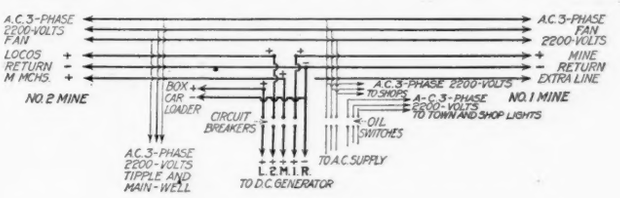


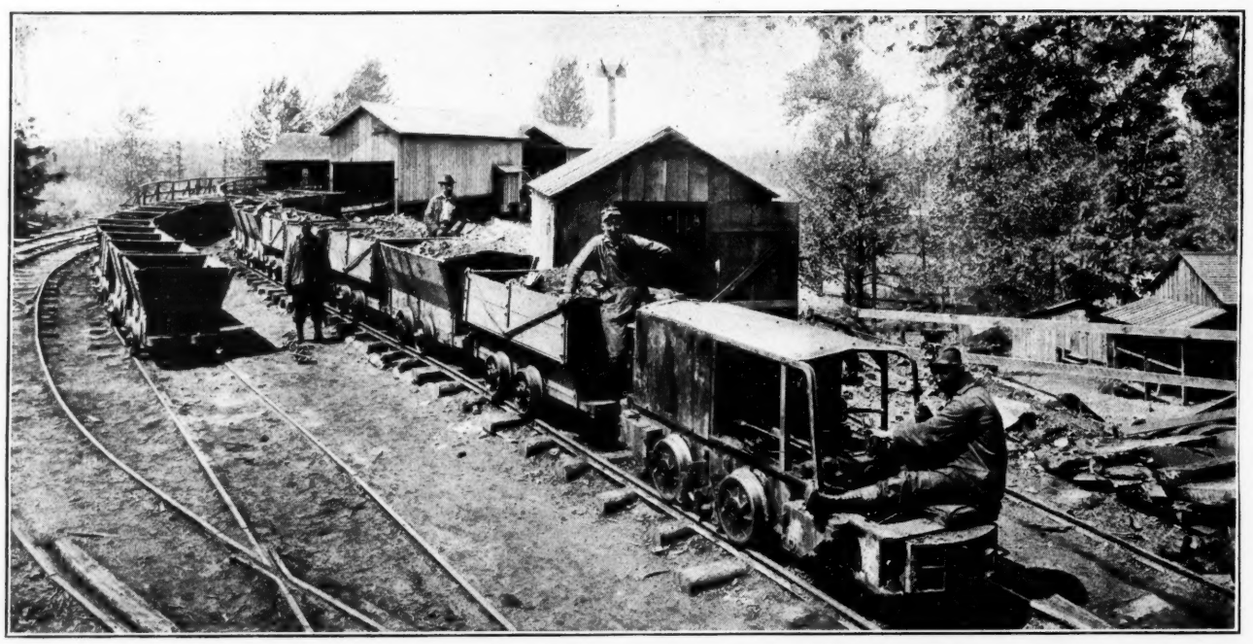

FIG. 6. DIAGRAM OF COMPLETED ELECTRICAL CONNECTIONS

The new installations were a success, and the operation of the substation now only requires one man where before it required the services of three high-priced men as well as the part time of several others. The substation is operated only during the day, as the fans, lights, shops, etc., do not depend for their current on the operation of the substation.

It will be noticed in Fig. 6 that the original direct-current fan breaker and switch were utilized, as was also the extra 4-0 copper feed line to No. 2 mine as a separate feeder line for the mining machines, thereby taking this load off of the feeder line for the mine locomotives. The circuit breaker and switch that had been on the town lighting circuit was utilized to advantage by placing it on the box car loader motor circuit. This was the only direct-current motor left in use outside. For various reasons it was decided to leave this motor in operation rather than change to an alternating-current machine. No mining machines were in operation at the No. 1 mine, so that there is now in place an extra 4-0 feed line to this point. It was decided to leave this line up for future use.

The change from isolated to central station power was successfully made without delay or accident. The use of induction motors on the mine-fan drives eliminates much of the trouble always experienced with the direct-current type of motor.

The change from a series system of lights at a high voltage to the standard 110/220-volt, multiple system is a decided improvement.



# Northwest Needs Man Power

By CHARLES P. NORTON
Seattle, Wash.

SYNOPSIS—*The mines of the Pacific Northwest require more men in order to operate to capacity, and only by operating to a maximum will a local fuel famine be averted next winter. Living conditions in this region are excellent and opportunities for promotion many. Interrupted operation can be avoided by an extension of market. This would be particularly advantageous to the small mine.*

SHALL the country have a coal shortage next fall and winter, with all of its consequent suffering and delay to war work? Last winter the Pacific Northwest was the only section that did not suffer. Having just completed an investigation of conditions, I can forecast now what is liable to happen during the coming winter, even in the favored Pacific Northwest. This is a warning that should be voiced with vigor.

There is certain to be a shortage of coal in all markets. This will include household fuel, as well as steam coals, even if the output of the mines is maintained at the highest rate possible. In the Pacific Northwest, where conditions are most favorable, the maximum production cannot be reached unless at least 1000 additional laborers are found.

In all the mines of this region during June there was a shortage of men. The demand was great, the laborers were few, and men were leaving the mines every day —drifting into the cities and the shipyards. The mines of the Northwest were running June 15 at 75 per cent. of capacity. This was an improvement over the previous month, when the man power was about 60 per cent. The smaller mine owners are the ones who need the greatest encouragement from the Government in the way of enlarging the market, because, when the market becomes slack, the larger concerns with efficient and well organized sales organizations get the lion's share of the available business. The small mine is restricted, as a rule, in the possession of available capital, and cannot readily resume maximum operation after having suffered a slack period.

The percentage of lump or household coal produced is small, averaging 20 per cent. perhaps, of the total output. The remainder is used for steam coal and industrial purposes. If work slackens the mines can not produce household coals any faster than they can dispose of the 80 per cent. of finer (steam) coals. A good demand for household coals would make no appreciable difference.

What remedies can be applied? First, the market should be enlarged. A coal shortage exists all the time to the eastward. Therefore, coal should be kept moving east from the western district.

Harvesting and its demands upon man power will not affect the coal-mining labor supply to any marked extent, because few men of the mines go into the fields. The nationalities now represented at the mines are, in the order of the numbers employed, Italians, Swedes, Austrians, Slavs, Finns, Welsh and American.

Working conditions in the Northwest are good. The mines are well ventilated, the air underground being as good as it is above, while the working places are cool and comfortable. At all the mines the men with families can rent comfortable cottages, with large yards on which grass has been sown; and that may be kept up for $7 the month, plus 50c. for water (which is of the purest) and 50c. for electric light. At the company stores provisions and necessities, including desirable delicacies, are sold at just enough above wholesale cost to pay the expense of operating the store. Here

many commodities are offered at prices less than those demanded at even the largest stores of the metropolis. Government food regulation may change all this, but the *a priori* facts are as stated.

Wages at the mines are satisfactory. Underground miners get $5.89 a day; laborers $5.20; outside laborers $4.65. The boy supply in June was adequate. Outside boys get $3.40; underground boys $4 to $4.10.

The miners may work on a contract basis, and some who do so earn as much as $300 a month. They pay $2.50 to $3.50 per ton for the best lump house coal—less than it costs to take it from the mine.

The latest equipment, to reduce necessary man power, has made possible the firing of boilers by a greatly reduced force at one of the mines. Waste coal is handled by three men, where before there were twelve. The work has been coördinated also and simplified.

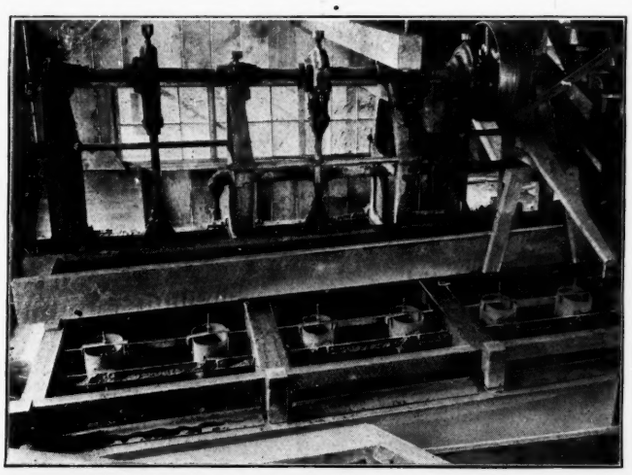
On account of slack production, coal cannot be produced and delivered any cheaper in summer than in winter. This might be done if production were full, but this is never the case in summer. The coal mines are dependent upon some one railroad line, as a rule, to deliver their output to market. In winter the rain and snowstorms impede the railroads and delivery of coal is uncertain. Teams and trucks cannot handle it.

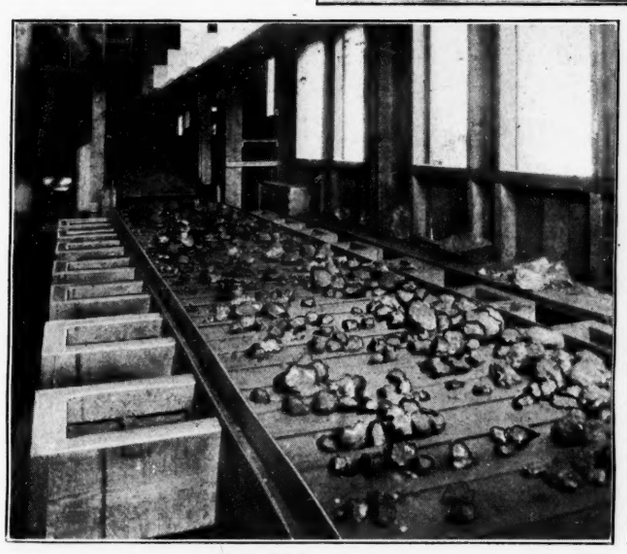
Community welfare work at the mines is progressive. A welfare nurse has served admirably during the last three years. She started first to do her work with the school children, teaching cleanliness and sanitation. The children's teeth were examined and general work was done without cost. Small fees were paid by those who could afford it and who preferred to do so. Eyes were examined and glasses were supplied. Physicians in Seattle generously donated their services, or accepted small fees from those who desired to pay. This beneficent work started before the war, and during the slack market period, when the men were working half time and the foreigners were sending their surplus money to the "old country," so that they had a narrow margin above actual living expenses.

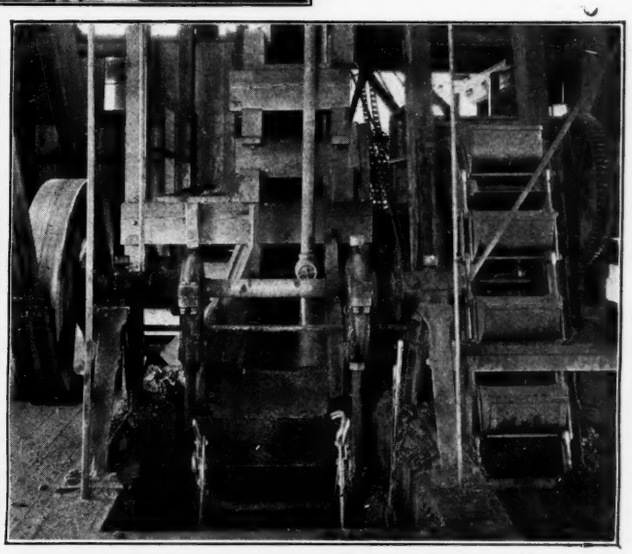
A model cottage was built at Black Diamond—the Seattle coal center—to show the miners how to establish a comfortable home, easily within their income. Women and children met frequently in the cottage, to learn scientific methods of housekeeping, cooking and sewing. This work has spread to all the camps and, in some way, reaches into the daily lives of all employees.

Social gatherings are held regularly at the mines and athletics is encouraged. The Black Diamond soccer team, for example, is noted for its championship performances in the cup tourneys of Seattle. Most of the coal-mining towns have baseball parks and also picnic and amusement grounds. Some places, especially Franklin and Coal Creek, have excellent bands. Practically all of the married miners have war gardens.

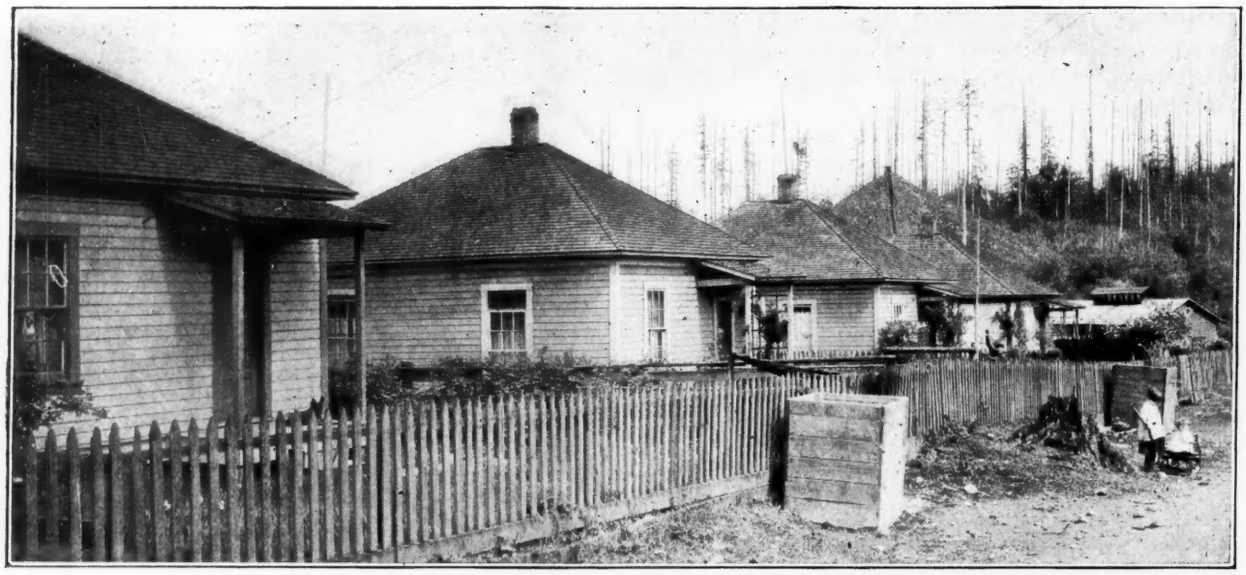
The coal-mining communities of the Pacific Northwest were among the first to inaugurate the practice of contributing regularly to the Red Cross. All the miners regularly give 1 per cent. of their wages, while the officials give 1½ per cent. In the third Liberty Loan, Black Diamond challenged all other towns of its size in America to equal its subscription. Its allotment was $6000 but its cash subscription was $63,650. The thrift stamp campaign also is well organized and the miners are continually increasing their investments. At each mine in the Pacific Northwest there is a committee of protection, to safeguard against treasonable acts of aliens. These organizations are formed exclusively of the employees, who constantly exercise the strictest surveillance over everything.



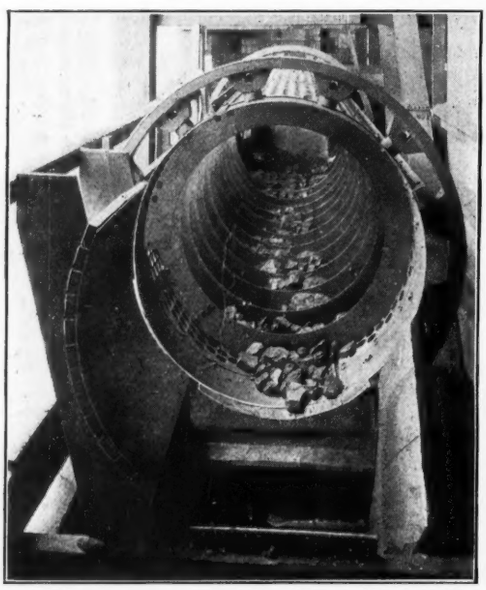




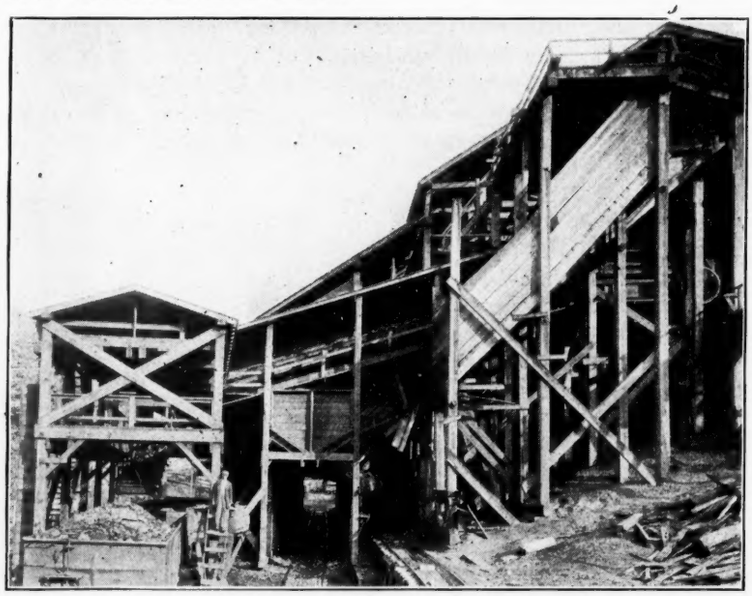
VARIOUS TYPES OF PREPARATION EQUIPMENT IN USE IN THE PACIFIC NORTHWEST



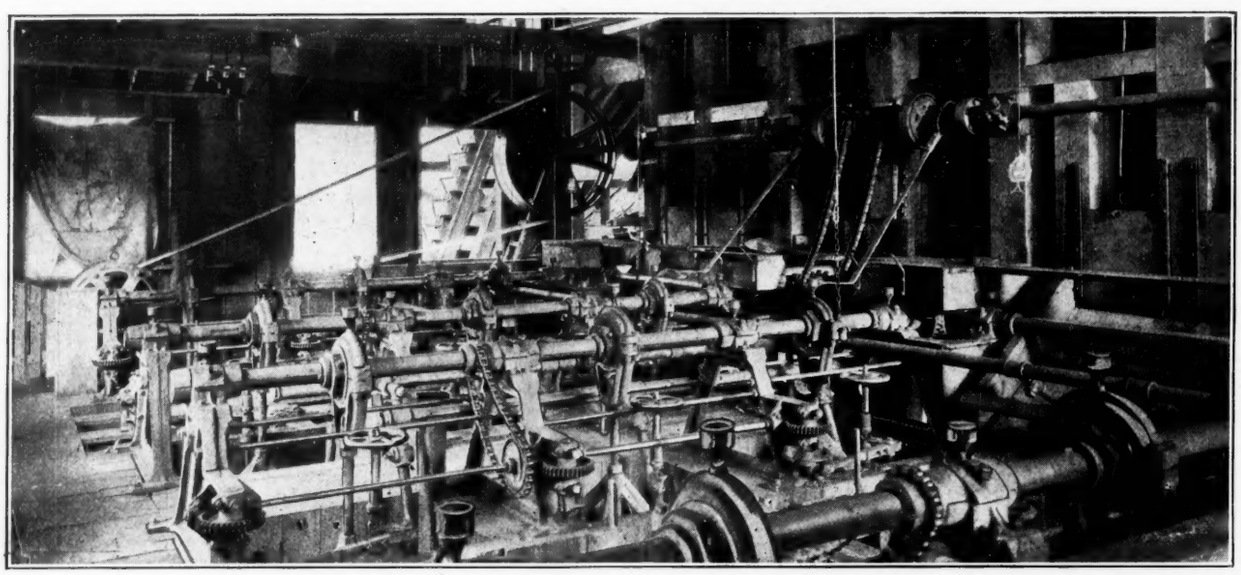
STREET IN A NORTHWEST MINING TOWN



REVOLVING SCREEN FOR SIZING COAL



TIPPLE AT A BRITISH COLUMBIA MINE



A BATTERY OF JIGS IN A PACIFIC NORTHWEST COAL TIPPLE

Opportunities for the men to advance their positions at the mines are excellent indeed. There is always a demand for experienced men who can qualify as foremen, superintendents, firebosses, etc. For example, a few years ago a certain employee of the Pacific Coast Coal Co. was driving a mule 12 hours a day for a wage of $1.80. He is now a superintendent. A chainman, who saw his first coal mine with the same company, a few years ago, is now a vice-president in charge of mining and general operations. There are many similar examples. Merit here comes to the top, and there is always room at the higher levels. In fact a majority of the officials of the Pacific Coast Coal Co. started at the bottom as miners or laborers, and a majority of the executives and foremen are men from the ranks.

The whole Northwest is now being combed, by a unique personal method, to find experienced men for the mines. One man, for example, having an extended personal acquaintance with miners, devotes his entire time to looking them up and inquiring for others. He frequents the hotels and amusement places and every miner whom he meets tells him how to locate others. This system is producing good results and man power is being somewhat augmented.

In these mines most employees can save at least 50 per cent. of their wages. Many of them are putting away more. The aggregate saving is thus enormous. The wash-houses at the mines, installed by the companies, become the property of the employees through the payment of a nominal sum monthly to cover interest and depreciation. The houses are equipped with shower baths and baskets for clothing.

The hospital association service, controlled by the men, costs $1 per month for each worker, and they employ their own physicians, who attend the miners and their families.

At least 500 more miners, preferably men with families, are wanted in the Pacific Northwest in order to secure maximum operations during the summer, fall and winter. If they are obtained, there will be nc local shortage, and with maximum operation there will be a large surplus of coal for the Eastern markets.

On account of Seattle's importance in ship production for the Emergency Fleet Corporation, it is desirable that every effort be made to prevent a shortage of coal. In addition to ships the 1200 industrial plants at the Seaport of Success are now on a war efficiency basis and will be working night and day from now till the end of the war. Even after the close of hostilities they will be kept going full blast for years to supply local demands and those of Alaska, Siberia and the Orient.

## Plant of Conemaugh Smokeless Coal Co.

BY CHARLES MARTIN
Smokeless, Penn.

The Conemaugh Smokeless Coal Co. has made many modern improvements recently at its plant at Robindale, Penn. This village is located about 8 miles west of Johnstown, on the main line of the Pennsylvania R.R. and directly across the river from the town of Seward, with which it is connected by a swinging bridge.

The town is laid out with avenues paralleling the railroad and streets running at right angles thereto. A large plot near the center of the town has been left open and will be used as a playground and amusement park. The streets are graded and provided with tile sewers, while each street intersection is illuminated by an electric light.

The houses are of modern construction, being built of tile. Four- and six-room bungalows, five-room double and six-room single houses have been built. All are electrically lighted and provided with running water.

The town water supply is derived from a mountain stream. From this stream the water is pumped to a tank at the works that has an elevation of about 70 ft. This gives ample pressure everywhere in the town, but the water mains are also connected to centrifugal pumps at the mine, so that these can be used in case of an emergency, such as a fire.

SURFACE PLANT OF THE CONEMAUGH SMOKELESS COAL CO. AT ROBINDALE, PENN., AND A VIEW OF ONE OF THE STREETS

The coal is reached both by shaft and slope. The mine is electrically equipped throughout and the coal undercut by means of Sullivan shortwall machines. It is hauled to the shaft bottom by electric locomotives and hoisted on self-dumping cages. At the top of the tipple it is discharged upon a conveyor that carries it to the railroad cars.

A new 9 x 4½-ft. double-inlet reversible Sirocco fan, driven by a 205-hp. McEwen engine, to which it is direct-connected through the medium of a Frankie coupling, has recently been installed. This machine is capable of producing 200,000 cu.ft. of air against a 4-in. water gage. At present, however, it will be necessary for this fan to operate only at 82 r.p.m., at which speed it will produce 57,000 cu.ft. of air per minute.

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Lunge gives a list of over 200 compounds which have been found or may reasonably be presumed to exist in coal-tar. In contrast with gaseous hydrocarbons those which are liquid and solid contain a much larger number of carbon atoms in the molecule and consequently deposit more carbon when they are cracked.—*Bureau of Mines Bulletin No. 135.*

## *Who's Who In Coal Mining*

### F. E. Herriman

F. E. Herriman, who was recently appointed to the new position of Coal Traffic Manager of the New York Central, began railroad service in 1874 as clerk to the superintendent of the Cincinnati, Sandusky & Cleveland, and served consecutively as secretary to the general manager, assistant to the president, and purchasing agent of that road, and coal and lumber agent of the Chesapeake, Ohio & Southwestern, at Louisville, Ky. In 1885 he was made General Freight and Passenger Agent of the Beech Creek, where he remained for 14 years. He then came to the New York Central as division coal agent of the Beech Creek district, and in 1901 was made General Coal Agent of this road and of the West Shore, where he remained until Oct. 1, 1905. He was also General Coal Agent of the Boston & Albany and other New York Central lines. Since the acquisition by the New York Central of the great Beech Creek coal properties and the railroad extensions into that bituminous coal region, Mr. Herriman has had charge of the commercial development. The problem was not the simple one of mining coal and selling it. In his relations with the other coal carriers, as well as with the users of coal, his work was probably as difficult and delicate as any that comes to a traffic officer. His was the duty of "butting in" with a new supply and a new line, and of course his instructions were to get a fair share of the business.

F. E. HERRIMAN

He continued as Coal Traffic Manager of the New York Central lines east of Buffalo until he was invited in September of last year (after 33 years' service as a traffic official of the New York Central lines) to join the staff of President A. H. Smith as the active head of the coal development policies of the New York Central lines. On June 19 Mr. Herriman was appointed vice president of the Clearfield Bituminous Coal Corporation.

## Vancouver Island Production in May

The coal produced by the Vancouver Island (B. C.) mines during the month of May totalled 143,379 tons. This is 4718 tons less than was produced in April, which is accounted for by the May holidays. The tonnage produced by the various collieries was as follows:

| | Tons |
|---|---|
| Canadian Western Fuel Co., Nanaimo colliery | 63,807 |
| Canadian Collieries (D) Ltd., Comox colliery | 50,163 |
| Canadian Collieries (D) Ltd., Extension colliery | 19,781 |
| Pacific Coast Coal Mines, Ltd., South Wellington | 7,660 |
| Nanoose Collieries, Ltd., Nanoose colliery | 1,968 |
| Total | 143,379 |

The coal produced by Vancouver Island collieries for the five months up to and including May, 1918, totalled 717,266 tons, as follows:

| | Tons |
|---|---|
| Canadian Western Fuel Co., Nanaimo colliery | 328,299 |
| Canadian Collieries (D) Ltd., Comox colliery | 232,255 |
| Canadian Collieries (D) Ltd., Extension colliery | 97,781 |
| Pacific Coast Coal Mines, Ltd., South Wellington | 42,764 |
| Nanoose Collieries, Ltd., Nanoose collieries | 16,167 |
| Total | 717,266 |

In spite of the fact that the Jingle Pot Mine, Nanaimo, has been closed all year; that Nos. 1 and 2 slopes of the South Wellington colliery of the Pacific Coast Coal Mines have been abandoned; that No. 4, Extension colliery, of the Canadian Collieries (D), Ltd., also has been abandoned; that No. 6 Mine, Comox colliery, Canadian Collieries (D), Ltd., has been closed; and that some of the other mines have been put on single shift because of lack of labor, the tonnage of the Island mines has been maintained to last year's standard, within a few thousand tons. To date the Western Fuel Co. has made a gain over last year's tonnage of 60,000 tons and the Nanoose collieries of 9786 tons.

## New Plant for Connellsville Region

A corporation known as the Rainey-Wood Coke Co. has been organized by the W. J. Rainey interests, operating coal mines and coke works in the Connellsville region, and the Alan Wood Iron and Steel Co., with blast furnaces and steel works at Swedeland, Penn., for the purpose of constructing a large byproduct coke plant of 330 ovens at Swedeland, Penn. The coal for this plant will be furnished by the W. J. Rainey mines in the Connellsville region. Work has been started on the first unit of 110 of these ovens, and it is expected to have the plant in operation within fourteen months.

This first installation will supply coke, gas and tar to the Alan Wood Iron and Steel Co. and will have sufficient additional capacity to furnish foundry coke for the Eastern market. A complete byproduct recovery plant will also be constructed for the purpose of furnishing sulphate of ammonia and toluol to the United States Government.

It is proposed to install the remaining units at the earliest possible date, in order to insure a continued coke supply for the independent blast furnaces in the Schuylkill and Lehigh Valleys.

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After the soot has once been formed it is difficult to burn it in the atmosphere of the furnace. This fact has been observed by many investigators, and some of the early writers on combustion even considered soot as noncombustible.—*Bureau of Mines Bulletin No. 135.*

## Alleges Great Profits Were Made by Many Coal Operators

Nothing short of a sensation was caused in Washington by the report of the Federal Trade Commission dealing with the profits of various industries. The commission finds that the bulk of the coal production has been marketed at large margins under the Government's prices. After reviewing the situation in the flour-milling industry, in which large profits were made, the commission says:

The situation in coal gives still another angle of view to the same problem. Maximum prices were fixed by territorial divisions. Many of the coal producers have not taken the maximum, but due to the fact that in a given field there is a very wide range in the cost of the coal produced in that field, it follows that certain low-cost producers have made very large margins under the system of governmental fixed prices for the field. Many high-cost producers have made small margins. The bulk of the production of course enjoys the large margin. Information on the return on the investment, now being collated, will reveal the exact amount of profit. Percentages of profit worked upon investment will obviously be very large in the case of low-cost companies.

The experience with steel, flour and coal shows that a high stimulating fixed price, while stabilizing an ascending market, produces an economic situation which is fraught with hardship to the consuming public and with ultimate peril to the high-cost companies through increasing the power of their low-cost competitors.

Continuing, the report has the following to say with regard to coal:

In connection with the distribution of coal it may be pointed out that prior to the official regulation of jobbers' and of retailers' margins in August, 1917, there was evidence that many of the margins were unduly high when compared to the pre-war margins. Details can be found in the Report of the Federal Trade Commission on Anthracite and Bituminous Coal, June 20, 1917. Since the regulation was established most of the jobbers' transactions have been carried on within the fixed margin, and whenever violations have been detected the jobbers have been forced to refund the overcharges. It should be understood that jobbers' and retailers' margins do not represent net profits alone, but also include all expenses incurred by them from the time coal is purchased until it is sold.

Generally speaking, the bituminous coal operators in 1917 had very much larger margins than in previous years. While in 1916 the margins (what operators actually received for coal sold over f.o.b. mine cost) may be regarded in some cases as lower than normal, yet the margins of 1917 were often two or three times the normal return. In the figures for 1916 and 1917, mentioned below, return on investment must be covered in margins shown. The increase of margins is illustrated by an examination of the returns for 1916 and 1917 of 23 typical bituminous coal companies in the central Pennsylvania field. The average margin of these companies in 1916 was 20c. per ton, and in 1917 was 90c. The highest margin for any company of the 23 companies in 1917 was $1.85. The corresponding margin for this company in 1916 was 41c. Similarly, the lowest margin for any of these companies in 1917 was 27c., the corresponding margin for the same company in 1916 being 13 cents.

Maximum coal prices f.o.b. mines were authoritatively fixed Aug. 21-23, 1917, by executive order, and subsequently modified by the Fuel Administration. Contracts made before that time were not invalidated. In some fields as high as 90 per cent. of possible production was sold under contract prices. While some contracts were below legal maximum price, probably much the greater part of the coal sold under contract went at prices substantially in excess of legal maximum prices fixed for current sales.

April realizations contain relatively little coal sold on contracts made prior to Aug. 21, since most such contracts expired Apr. 1, 1918. Sample reports for April operations, covering 12,619,274 tons actually mined in West Virginia, Pennsylvania, Ohio, Indiana, Illinois, and Kentucky, show an average margin between claimed f.o.b. mine cost and actual realization from sales of about 54c., as against a pre-war margin of an average of 10 to 15 cents.

In anthracite the average receipts per ton, including all sizes, during the year 1914 (13 companies, producing 79 per cent. of the total tonnage in 1916), were $2.86 per ton. The average receipts per ton of anthracite, including all sizes, allowing for later obligatory summer discounts on prepared sizes, during the period January-March, 1918 (six companies, producing 50 per cent. of the tonnage in 1916), were $4.26 per ton. The average labor cost increase per ton since 1914 was $0.76, and if this is deducted from the 1918 average receipts per ton an increase of $0.64 per ton (or 22 per cent.) in average receipts is indicated without allowance for increased cost of supplies and general expense.

## In Charge of Clean Coal Inspectors

Inspectors charged with examinations to determine that the clean-coal regulations of the Fuel Administration are being carried out have been placed under the immediate direction of J. M. Roan. Mr. Roan's headquarters will be at Columbus, Ohio.

## To Save Considerable Coal by Economy in Industrial Power Plants

Fully 20,000,000 tons of coal will be saved this year, the Fuel Administration expects, as an outcome of savings which are being effected at power plants. There are 250,000 industrial power plants in the country. At many of these, the amount of waste is considerable. Every power plant east of the Mississippi River is to be visited by an inspector and given a rating based on the thoroughness with which the owner of the plant carries out the conservation recommendation. The plan is based

on the use of the present equipment without the installation of fuel-saving apparatus.

Administrative engineers will be in direct charge of this work. Thomas R. Brown, of Pittsburgh, will direct the conservation program in western Pennsylvania. George R. Henderson, of Philadelphia, will be in charge in eastern Pennsylvania. The campaign in the State of New York will be directed by Edward N. Trump, while W. R. C. Corson, of Hartford, will be the engineer administering the work in New England. Henderson W. Knott, of New York, will manage the field force from headquarters in Washington.

## Price of Lump Cannel Coal Increased

On securing a permit from the Fuel Administration, lump cannel coal may be sold at $1 per ton in advance of the run-of-mine price of bituminous coal in the same district. An additional charge of 50c. is permitted if it is loaded in box-cars.

## New Ohio Coal Prices Announced

Price revisions for Ohio were announced the latter part of last week and were distributed by the Southern Ohio Coal Exchange. As the new prices were made effective at 7 a.m., June 29, the changes were made at short notice. The most noteworthy readjustment made was that of naming counties and townships in the making of prices. The coal is not classified solely as of thick- and thin-vein, as in the former price list.

The counties of Hocking and Athens, and the south half of the township of Monroe, in Perry County, is defined as the thick-vein field, and the new prices are: Mine-run, $2.55; prepared sizes, $2.80; slack, $2.30.

Prices for Bailey Run, or No. 7 seam, which is defined as thin-vein, are: Mine-run, $2.95; prepared sizes, $3.20; screenings, $2.60. In Guernsey and Muskingum Counties, which is also classed as thin-vein, the prices are: Mine-run, $2.70; prepared sizes, $2.95; slack, $2.45.

In Meigs County, which is known as the Pomeroy Bend field, the prices are: Mine-run, $2.80; prepared sizes, $3.05; screenings, $2.55.

Jackson prices are reduced about 15c. on the ton to the following: Mine-run, $3.45; prepared sizes, $3.70; screenings, $3.30.

Prices in eastern Ohio, or Pittsburgh No. 8 seam, are unchanged.

## Weekly Production Statistics

Production figures for the week ended June 22 are as follows: Bituminous coal, 12,016,000 tons; anthracite forwardings, 41,170 cars; beehive coke, 604,000 tons; byproduct coke, 489,542 tons. With the exception of byproduct coke, each of the totals is a decrease, as compared with the accomplishments of the week preceding.

While the decrease in the production of bituminous coal was 5 per cent., as compared with that of the week preceding, the output was still safely above 12,000,000 tons. The fact that that figure has been exceeded for three consecutive weeks has caused great encouragement at the Fuel Administration. The total production for the last twelve weeks has been 137,705,000 tons. The production for the week ended June 22 was 60 per cent. greater than that during the corresponding week of 1917.

The decrease in anthracite shipments was 1.9 per cent., as compared with the week preceding, but is above the average number of cars forwarded weekly.

Shortage of labor was the only important factor interfering with the production of beehive coke, during the week ended June 22. Owing to the inability to secure yard labor, it is estimated that the production of 106,000 tons of beehive coke was lost. Cars could be had in ample quantity at practically every oven. Byproduct ovens were operated at practically 90 per cent. of maximum capacity. Necessary repairs to plants was the chief limiting factor, to which was added some loss of production, due to labor trouble.

Figures referred to in the foregoing are estimates made by C. E. Lesher, the geologist in charge of coal statistics for the United States Geological Survey.

## Needless Illumination To Be Cut Out

Failure on the part of nearly every city and town in the country to prevent a waste of electricity has made necessary new action on the part of the Fuel Administration to save the coal which is being used for needless illumination. This action is taken, Dr. Garfield says, because "the country needs now—and for the whole period of the war will need—more coal than it can possibly produce and transport."

## Profits Made by Coal Companies Exaggerated

Of the 2698 corporations engaged in mining coal during the year ended Dec. 31, 1916, only 1833 were conducted with a profit. This fact was brought out when the Treasury Department made public its compilation of income-tax returns for 1916. The disclosures of this report are held to be the best indication that the conclusions of the Federal State Trade Commission with regard to profits of coal-mining companies are exaggerated.

## Brief Washington Notes

R. C. Norfleet, of Winston-Salem, has been named state fuel administrator for North Carolina.

The United States Fuel Administration has taken direct charge of fuel requirements for the District of Columbia.

Joseph H. Frantz, of Columbus, has been appointed fuel administrator for Ohio. He is vice president of the Columbus Iron and Steel Company.

Twenty-five additional inspectors have been appointed by the Fuel Administration to guard against the shipment of coal for bunkering purposes which is not up to standard.

*Back up those who are offering their all—buy War Savings Stamps.*

*When you buy War Savings Stamps you do not give—you receive.*

# THE LABOR SITUATION

EDITED BY R. DAWSON HALL

## General Labor Review

Already restrained as to the prices at which they sell their coal, the operators are now to be restrained as to the wages they shall pay. This restriction they are quite willing to approve; in fact, it seems to have been first advocated by certain of them. Central Pennsylvania appears to have had more than her share of fly-by-night mines which were ready to pay all manner of bonuses and ready to give all kinds of prizes. No one objects to anything which will encourage production, but the action of bonuses and prizes was not so marked apparently in the stimulation of output as in the increase of turnover. The men were always being coaxed from the employ of the mines paying the regular wage scale to enter some other mine where a lordly bonus added to the earning.

Central Pennsylvanians have always been keen competitors. They formerly competed bitterly as to sales and railroad cars; now their competition is for men. In either case the energy of their business methods results in making their industry unprofitable. The drift of men from mine to mine makes it hard for the railroad to apportion cars equitably, because the capacity of a mine depends on its working forces, and where men are drifting around, no one on the railroad can tell how many cars any mine should have. Moreover, when men are shifting back and forth with their families, there is a minimum of output and in the long run no one is the richer.

### NAY AUG IS GOING TO TRY THE NINE-HOUR DAY

The anthracite region's difficulties are but little changed, though the energy which the operators are exhibiting in "Win the War" propaganda promises success. The Nay Aug Coal Co., a small company at Dunmore, in the Scranton district, has induced its men to work 9 hours.

In the Lansford district many men are refusing to sign production pledges. They say it requires of them too uncompromising a promise to work whenever physically able, but their contract already demands this and nothing less than this. They cannot strike now without violating binding obligations. But this new pledge being signed personally, not collectively and by delegate, is more solemn than the wage agreement, even though it is not balanced by any return pledge on the part of the operator. The mine workers, therefore, balk at signing it. It is no time for such a decision as they will soon find if they persist in working irregularly.

In Illinois, Belleville and Taylorville have been chosen two of the subdistrict headquarters. Next year's subdistrict convention in the Belleville district goes to Collinsville. A labor temple will be built in Belleville after the war and every subdistrict will probably have a similar building to house its activities.

### CHARGED WITH THREATENING TO BLOW UP MINE

Dominick Coma, of Edwardsville, Ill., is under arrest, accused of threatening to blow up a mine at Troy, Ill. He is also said to have interfered with the draft. It is stated that he drew the pay checks of two miners who disappeared just before the time at which they were required to register for the draft.

Because Senator L. V. Sherman has denounced the labor disturbances in and around Springfield as unpatriotic, the mine workers of that district to the number of 12,000 resolved recently that "by his tactics of stirring up class hatred he is rendering aid and comfort to the enemy" and should be "interned during the war."

The operators of this country have always been opposed to propaganda. Nothing has been harder than to arouse them to the necessity for an expression of their views as to the way in which their employees should meet the industrial conditions. But at last in a fuller measure they are beginning to realize their leadership.

When they come to present their views to their men, perhaps those views will be somewhat modified and amended and that perhaps will not be at all unfortunate. It is well to be obliged to study the reactions of others. It sometimes enables one to see the other man's point of view, which will be found not entirely devoid of reason.

In the Southwest the publicity campaign has taken the form of issuing the minutes of a conference relating to the production of clean coal in large quantity. Perhaps the mine workers will wade through this cumbrous document and learn that the nation and not merely the operator is calling on him for clean coal. But the Southwestern mine worker must be a studious fellow if he will do more than glance at the lengthy pamphlet with its fine type, copiously signed as are the resolutions in it, on behalf of the union, the operators, the fuel administrators and the coal inspectors.

### HOLD A CLEAN-COAL CONFERENCE IN SOUTHWEST

The conference referred to met on June 17 at Kansas City and was attended by the Southwestern Interstate Coal Operators' Association, the Oklahoma Coal Operators' Association and the Iowa Coal Operators' Association, the presidents of the union in District 13, Iowa; District 25, Missouri, and the vice presidents of the union in District 14, Kansas, and District 25, Missouri. H. N. Taylor was present as district representative for Production Zone 17, with Charles Means, who is general manager of the Inspection Department of the United States Fuel Administration.

A patriotic poster issued by the Southwestern Interstate Coal Operators' Association tells the story regarding the need for more coal in words that cannot fail to appeal.

It is interesting to notice that mine workers in Illinois are now striking to compel the employment of a woman at a mine job. On the other hand, a few days ago the anthracite miners were threatening to strike to prevent the employment of women, and they could not be pacified till the women were ousted.

But neither operator nor mine worker dare be satirical about this. The story could be told in another way. The operator in Illinois who refuses to employ this woman and would rather have a strike of his men than engage her is acting in a manner almost exactly contrary to the operating company in the anthracite region that put on several women and tried to make the mine workers permit of their employment.

Some special reasons made the mine workers favor her and doubtless special reasons may make her employment undesirable to the operator. But on the face of the situation as presented it is not possible to declare either mine workers or operators the more unjustified in their contradictory stand, but this should be added, that a strike, especially a strike to disturb the present status, is not now justifiable.

## Will Not Collect Death Benefits

The Susquehanna Collieries Co., with many other coal corporations in the anthracite region, has a matter of dispute with its employees that should be settled without delay if steady production is to be maintained. In the issue of June 15 the difficulty of the Lehigh & Wilkes-Barre Coal Co. in the matter of funerals was discussed. The Susquehanna company has a somewhat similar trouble. Three men were killed in a cave-in of the Short Mountain colliery, one of the Susquehanna operations, on June 17. On June

20 and 21, 1000 men employed at that colliery refused to work, declaring that such work on the day of the funeral of a victim of the operation of the mine was against the provisions of their local union.

It appears that the Susquehanna Coal Co. at the request of the mine workers' union agreed that whenever one of its men was killed it would deduct 25 per cent. from the wage, for a single day, of every mine worker employed at the plant. After the company was required by law to compensate the mine worker's family whenever an accident occurred, this seemed an unnecessary provision. The argument of the company was that the men could make any private collections they saw fit, but the Susquehanna Coal Co. did not feel that it was right to compel men to pay a compensation to people who were already well protected by law.

This is the attitude of the Susquehanna Collieries Co., which has recently succeeded the Susquehanna Coal Co. The funeral of two of the three victims occurred on June 20. The third was buried on the day following. The employees of the colliery observed both days as a holiday, declaring that only in this manner would the company suffer them to show their sympathy with the bereaved. About 4000 tons of coal would have been mined in the two days had the miners worked steadily. It must be understood that these funeral strikes begin and end on the day of interment of the unfortunate mine worker involved.

## Which Men Aid Their Country Most?

Loyalty demonstrations still occur from time to time in the Illinois field. In Edwardsville, where a jury acquitted the lynchers of Robert Paul Prager, German enemy alien, 35 men went the other night to the home of Jacob Gent, a coal miner. This man's loyalty had been brought into question because he wrote to Governor Lowden denying the alleged disloyalty of the Rev. J. D. Metzler, a Catholic priest, who had been driven out of the town. He was made to swear his loyalty and kiss an American flag, which was then erected in front of his home.

Now that the railroads are giving a better car supply, the wonderful efficiency and patriotism of some miners and companies is being attested by the large earnings some of the miners are now making. It may be added that such efficiency and patriotism is not only creditable to those exhibiting it, but pays big dividends to the efficient and patriotic. Among all the miners of large production in Illinois George Weiss, of Freeburg, in St. Clair County, claims the first place. In his last pay envelope was $240. It was the earnings for only two weeks' work, eight hours a day. During that time two half days of time were lost. The previous record for two weeks' work in the Illinois field is said to have been $198. Men who quietly occupy themselves in mining coal do more for their country than those who run around hounding men like Prager and Gent against whom no charges can be substantiated.

## Banning Bonuses and Overpayments

A meeting of the coal operators of the District of Central Pennsylvania, was held at Washington, D. C., on June 26. It was called to consider a remedy for the evils growing out of the so-called "bonus system." The following resolution was unanimously adopted:

"Whereas, it has been brought to our attention by the Fuel Administration that many coal operators are granting bonuses and other inducements for labor, thereby causing unrest, unusual labor turnover, and interfering with the maximum production of coal;

"Resolved: That we recommend that the Fuel Administration close down those coal mines in central Pennsylvania, as being wasteful and too uneconomic to operate during the present war, where the wage rates or conditions offered exceed the rates and conditions in effect under the Washington Agreement, as applied to the Central Pennsylvania field, or decisions of the U. S. Fuel Administration thereunder.

"That a board of five members be constituted by the Asscciation of Bituminous Coal Operators of Central Pennsylvania, which shall determine in each case, after hearing the statement of the operator, whether he is operating wasteful and uneconomic mines such as are above described. The findings and recommendations of this board are to be subject to appeal to the Fuel Administration by any aggrieved party."

This arrangement having the approval of both the Association of Bituminous Coal Operators of Central Pennsylvania and the Central Pennsylvania Coal Producers Association, was naturally regarded by the United States Fuel Administration as a practically unanimous request from the coal industry in central Pennsylvania. The Fuel Administrator approved of the proposal but ordered that the board should have nine members, five to be nominated by the Association of Bituminous Coal Operators of Central Pennsylvania and approved by the Fuel Administrator and four others, consisting of the Presidents and Secretaries of the Association of Bituminous Coal Operators of Central Pennsylvania and approved by the Fuel Administrator and four Association.

The authors of the resolution proposed that a penalty be provided for those violating the Washington agreement, but this did not satisfy the Fuel Administration.

## Peoria Subdistrict Organized

Subdistrict No. 2, District No. 12, United Mine Workers of America, has been organized at Peoria. The new subdistrict includes Peoria, Tazewell, Fulton, McDonough, Rock Island and Mercer Counties, as well as the mines at Sparland, Ill. W. E. Sherwood, of Canton, was elected president; M. Gallagher, of Hanna City, vice president; and W. H. Thrush, of Hanna City, secretary and treasurer. The compensation of the president and secretary-treasurer was fixed at $2035 and expenses per annum. The compensation of the vice president was placed at $6.50 per day when actually on duty. The headquarters will be at either Peoria or Canton. The new subdistrict was organized in a blaze of patriotic fervor and a determination to produce coal for the nation in greater quantities than ever before.

## Illinois Miners To Mine More

President Frank Farrington, of the Illinois miners, speaking at the district convention at Springfield, said that the shortage of coal next winter would be more keenly felt than last winter, and that it was the duty of the miners to work every day so as to mitigate the famine which is sure to come. "Five million men will soon be fighting in France under the American flag," he said. "Many of these will never come back. Many will return crippled for life. How can a man who has not done his full share associate with the men who have given so much for their country? Can a man who refuses to do an honest day's work look these men in the face?"

The Springfield district convention adopted a resolution imposing a fine of $25 upon any miner who fails to drive a 12-ft. room neck a full 12 ft. wide. It was decided to lodge a protest with state mining officials against the high prices now being paid by miners for blasting fuses. It is said that though the fuse is expensive it is nevertheless faulty and dangerous. The state officials will be requested to take the matter up with the National Government.

## In Illinois Union Backs Minerettes

Chivalry and patriotism are being invoked by 600 miners employed by the Chicago, Wilmington & Franklin Coal Co. at Thayer, Ill., to justify a strike which has continued two weeks and which officers of the United Mine Workers of America have been unable to settle. The demand of the men is that a woman with two children, whose husband has gone into the army, shall be given the job of the weighman at the mine, William Shutt, who was called to the colors two weeks ago.

When Shutt went away the war widow, who lives at Virden, was an applicant for the vacancy, and the miners favored her application. But the company employed Frank

Riva. The top men immediately filed an objection and were backed up by the diggers. Demand was made upon the company for the removal of Riva and the appointment of the woman. The company refused to give her the place and the men quit work. In the two weeks since they threw down their tools they have worked only 10 hours.

On Friday of the first week of the shutdown state officials of the union visited Thayer and prevailed upon the men to return to work. They worked five hours that day and five hours the next day, which was the day of election of union officials, and for this reason was a short working day. By Monday morning the effect of the officials' arguments had evaporated, and the men have continued to absent themselves from the mine. A Canadian army recruiting officer who happened to be in the neighborhood tried his hand as a peacemaker, but had no success. Pressure has been brought to bear upon Riva to resign, but he refuses. He is said to have been threatened. Many of the miners, pending a settlement of the dispute, have been helping in the harvest fields.

## Missouri Miners Make Demands

Missouri is not much of a coal-mining state. The coal mines of that commonwealth are farther away from the river towns of Missouri than are the mines of Illinois. As the river towns include St. Louis, it is easy to see how sadly the Missouri mines are left in the cold. The refineries of the eastern part of the state are far closer to Illinois mines than to Missouri mines, and the Joplin lead and zinc district is almost equally remote from both Missouri and Illinois fields. However, Kansas City and St. Joseph are notably nearer the Missouri fields than those of the rival state.

The Missouri mines thus have a considerable handicap, which might not be decisive if the coal were purer and thicker. Unfortunately, the seams are quite usually thin and not exceptionally clean. As a result the mining field of Missouri has not been a regular and important producer.

The mine workers in the Fulton district, Callaway County, are demanding such large increases in wages that the operators are unable to pay the increase unless they can increase the selling price. This they are unable to do without Government permission. They are quite willing to have the Government take over the mines if it can be induced to do so. The miners are now getting $1.62½ a ton (6½c. a bushel) for open rooms and $1.87½ a ton (7½c. a bushel) for corner rooms. They demand $2 and $2.25 a ton (8c. and 9c. a bushel) respectively. For day work the mine workers are getting $3.25 a day. They demand $4.50. For room turning they want an increase from $7 to $10, and an extra payment in rooms where it takes two men to push out cars. The operators will have a meeting in a few days with County Fuel Administrator Harry Atkinson, who adjusted the wage controversy last year. There are eight mines in the district.

Judging by the comparatively low day wages, the digging of coal in the Fulton district mines must be accompanied with many difficulties or otherwise the miners would make many times as large a wage as the day men.

## New Light on Production Problem

One can trust the union to look upon the production problem from a different angle to the operator, but it is well to see the union point of view. It is apt to be not entirely unjustified. While urging the mine workers to work on the Fourth of July, work being the best kind of patriotic demonstration, President J. R. Kennamer and Secretary J. L. Clemo are sending to every local union a questionnaire.

The first question is one which an operator might ask: "How many days or hours were lost during the week on account of miners lying idle?" After this come a lot of questions which show that there are joints in the armor of the coal operator. He might well be asked to consider them. Bunching the questions together they run: "How many days or hours were lost during the week; (2) on account of miners having no timber for their places? (3) on account of bad air? (4) on account of water? (5) for lack of switches or track? (6) on account of the coal not having been cut in time for the loader by machine cutters? (7) from lack of railroad cars? (8) by reason of the necessity for handling coal two or three times before loading? and (9) by waiting for mine cars to be placed?"

Other questions inquire: "How many men were sent home every day in the week on account of grievances with officials of the company? What is the average car turn per miner per day? How many cars could be loaded per day by each miner if the company would keep a square turn and supply an ample number of cars?"

There are two sides to the mine-car question. Give the miners all the cars they can load as soon as they can load them and they will load what they want of them and go home. Consequently, there is no disposition to create "rush-hour" conditions by excessive equipment of cars, mules, locomotives and what not, nor by the employment of large numbers of drivers and motormen so that the work of the day can be done in the early part of the morning.

If the men would work hard for eight hours a day, the operator would be repaid in buying enough cars and equipment to give every man a turn equal to his utmost capacity. But they will not do so, and when an operator has sufficient equipment to bring out in a full day what the men are willing to load he is not disposed to buy more. The length of day having been shortened in Alabama, and equipment being exceedingly expensive and hard to obtain, the probabilities are that the equipment supply is somewhat inadequate. In fact, at most mines if the men show a disposition to do their utmost the equipment, which is only attuned to ordinary industrial effort, fails to respond to the great demands made on it.

**How They Do It in Pascagoula, Miss.**—The shopworkers of Pascagoula, Miss., give one day's pay for four months in aid of the Red Cross. Edmon J. Lane, chairman of the Red Cross Fund, says to Chairman Hurley, of the United States Shipping Board, in a telegram, "They are the finest bunch of generous, patriotic, true American citizens a community ever boasted and we are proud of them. These same shipworkers were responsible for our county making five times oversubscription on third Liberty bonds.

**Must Seek Unskilled Labor from Government**—The United States Employment Service has now been greatly developed and separated from the Immigration Service. After Aug. 1 the Employment Service will be the authorized medium through which to obtain unskilled labor, though men applying for work at a plant may be engaged. On June 17 the President solemnly urged "all employers engaged in war to refrain after Aug. 1, 1918 from recruiting unskilled labor in any manner except through this central agency."

**Employes of Two Companies Get Favorable Wage Decision**—On June 17 Charles P. Neil, the umpire of the conciliation board decided in favor of the men at the Clinton colliery of the Delaware & Hudson Co., awarding them an increase in their wage of 7 per cent. instead of the 3 per cent. that had been paid them under the company's interpretation of the last contract. The footmen at the Packer No. 3 colliery of the Lehigh Valley Coal Co., near Shenandoah, also received a favorable verdict, men receiving 27c. per hour being awarded 32c. by the umpire.

**Mining Pays a Young Man Far Better Than Teaching**—School teachers and high-school graduates are recorded to be entering the mines in Harrison County, West Virginia, which forms the southern half of the Fairmont field centering around Clarksburg. A score of teachers are already at work in the Fairmont district. Some of the younger men have been compelled to enter the mines by the pressure of the regulations against idleness, both Federal and local. The wages earned are large now that work is reasonably steady. One Syrian miner made $148.39 in two weeks, yet there was one day of lost time in that period. Many miners are making from $126 to $140 every two weeks.

# EDITORIALS

## Foreigners Expect Hardships; Why Not Disappoint Them?

THE laboring man of Europe comes here from a picturesque little village. It may not be sanitary, nor comfortable, nor commodious, but it is almost sure to be pretty and homelike. The men who come to our mines from foreign countries are mostly farmers, not miners or city dwellers. Their homes are embowered in the verdure of trees and gardens, with many a quaint and artistic adornment.

They come here to make money, and make it quick, and go home. They do not worry much about where they live or where they work. They are quite generally not intending to become naturalized when they arrive in America. Citizenship is quite rarely what these farmers expect to seek when they come here.

What do we do with them? We fall in with their ideas. We give them a chance to make money, lots of it. We house them as they are quite willing for a time to be housed. But home was never like this, and eventually they go back to the pretty home they left.

They take a lot of American ways with them. They wear American clothes and show by their new modes of life and democratic self-recognition that America has left its impress on them. They cause more foreigners to try their fortunes in America. These come, not intending to stay, though many ultimately make it their home. Perhaps we work out our destiny in this way as well as if we kept every foreigner who entered our ports. These homegoers send us recruits; they preach our gospel of equality, and they start weaving kindly fairy tales about us, as people quite generally do about the lands where they spent their earlier years.

But if we really want to keep them, naturalize them and rivet them to the soil, we must give them comfortable homes and beautiful surroundings and not merely such a house as they will accept as their temporary barracks.

They are like us. They like beauty just as much as we do, though most of them are not voluble in the expression of it, and many not overcareful in its preservation. Art in all its many forms is at least as indigenous to Europe as it is here. The people of Europe are more imaginative and impressionable than we are. Yet we think they will call a barracks home, and living in a squalid village will learn to become magniloquent about America. We all know it can't be done.

The America they know is the America they live in. The nation they know is not the nation expressed in ideals, but the nation expressed in the living conditions with which their lives are environed. The foreigner has no reason to complain. He came for money and he gets it. But though this is true, it is equally true that too often he has no reason to stay when the money is made. He wishes to spend his last days in a smiling environment, so he goes where nature smiles, and where he has friends who welcome him. He can hardly be blamed. He leaves without rancor, but he leaves nevertheless.

Do we want to hold him here? If we do, we must let him see something in America that will appeal to his inner temperament. He is more apt to talk about money than anything else, but is there nothing else he thinks about? Most of us find it hard to express the finer motives that actuate our lives. How much harder it is for the man who, not speaking our language, lacks even the vehicle of that expression.

## Fair and Unfair Taxation

THE PUBLIC is being brought by Congress to favor reasonable principles in its treatment of war industries. The disposition of Congress is not to single out for taxation the profits of war industries, but to put the burden on all excess profit from whatsoever industry obtained. A jeweler or platinum jobber who makes a large profit by keeping platinum on hand while the price soars is just as much entitled, and in fact far more entitled to pay a tax than the manufacturer who is making something in platinum that will serve our war interests.

The reply is, of course, that the manufacturer of useless things is going to be put out of business or restricted in his operations—after a while. Meantime he is allowed to go on his way almost unmolested, and there is a disposition with some to subject him to a taxation lighter than that put upon the man on whom the burden of war preparation falls.

We have recognized by our large pay to shipworkers the necessity and even the justice of allowing a generous reward to those who give up their regular occupations and tear themselves from their homes to engage in a war industry. We acknowledge that without this reward men would go on working at their old jobs around their own homes. The change to a new job in a new town involves expense and risk for which we are willing to pay them, for which, indeed, we must pay them, unless conscription of labor is to be resorted to.

Sometimes we cannot see that capital is equally entitled with labor to be rewarded for effectual service in war industry. But if we can not apply to capital what we apply to labor, we may, at least, concede that it is entitled not to be penalized for its support of the war.

The Federal Trade Commission has been investigating the production of essentials and found that some persons are making big profits in the manufacture of war necessities. It must be remembered that the Commission did not inquire into the production of nonessentials, but if it had it would have found that large profits were made in this work also. The natural result is to direct the public indignation against the industries thus exposed and leave the others, the less honorable businesses, free of censure.

It is like the attitude we take to the idler. Never having worked, we accept his idleness as a natural condition; but of the worker we demand that he shall come to work at the hour and for the time designated. We have learned to rely on him, and we turn on him uncompromisingly when he shows a disposition to be as undependable as the idler. It was as a reaction to this report that the war-industries tax was advocated. Reflection shows that the worker industries should, at least, have equal treatment with idler industries and pay no larger proportion of their receipts to the state.

A straight excess-profits tax applicable to all industries, essential and nonessential, does not penalize the manufacturer of war-worthy materials, nor does an income tax. Of all imposts, the income tax is the most equitable, while a tax on the income from luxuries is the most directly effective in putting us on a war basis. No one has ever been able to bring any other reasonable charge against the imposition of an income tax except its ease of evasion, and it would seem that with the freedom with which the Federal Government now investigates all business it should be easily possible to check all statements of income so as to remove the solitary objection to providing an extension to this form of impost.

However, it must be remembered that even the income tax makes no allowance for depletions of capital. All losses must be borne by the individual without relief from taxation. He does not pay on the real increment of his fortune, but on the increment only of his profitable investments. If the gain on the latter is not far greater than the loss on the others, he will inevitably lose heavily should the income-tax rate be made prohibitively high.

## Standardization of Mine Statistics

UNDER THIS title the Bureau of Mines has published a bulletin of forms for the gathering of mine statistics. The tables were prepared with the purpose of reducing the complications resulting from the division of authority between the Bureau of Mines, the state inspectional forces and the state workmen's compensation boards. All these various authorities desired reports on accidents and equipment.

All were apt to view the matter from a slightly different angle, and that fact made the collection of data laborious for the state and Federal authorities and even more trying for the owner and his agents at the mines. Albert H. Fay's knowledge of the industry and of the science of statistics and the recognized ability of the members associated with him in the committee on standard forms appeared likely to assure us that the task to which they applied themselves would be carefully and adequately performed. Unfortunately, the upshot was that the excellent forms prepared by Mr. Fay for accident statistics were considerably modified, not at all for the better.

It appears from the "First Report of Injury to Employee" that the superintendent or manager of the mine is asked to state of all accidents whether they occurred in the mine or on surface and also what were the mining methods in use. It would be interesting to know more than this; for instance, whether the accident occurred at the face, in some part of the room away from the face, or in the entry, or slope. Mr. Fay has been collecting that information and surely he has been fully justified. We might reasonably desire to have the form ask what the person injured was doing or presumably doing at the time of his death or injury—undercutting by hand or by compressed air or electric machine, timbering, loading, brushing, walking or resting—for accidents from falls of roof have a direct relation to the kind of work being performed. Thirdly, it would be interesting to know whether the operation was on the advance or in the skipping or the drawing of pillars, or again in longwall. For some reasons, which we cannot divine but which are possibly more or less imperative, many of the matters so interesting and suggestive in both the Pennsylvania and Illinois reports and in the reports prepared by Mr. Fay are omitted in the schedule that the committee on standard forms now presents.

In the name of mercy we have wished that the example of Great Britain might have been followed and some record have been kept of the fatalities of the mining stock. The industry is unfortunately not any too kind to the mine mule. These poor animals are allowed to stumble along in a dark mine without a light, with cars on the road and all kinds of bad traveling conditions, including open ditches and slippery planks, stepping over high ties on a run and lifting their feet with difficulty out of morasses of mud. Their treatment is none too creditable to the hearts of their masters, and something should be done to make their woes and ill treatment a matter of record, especially as many of their accidents jeopardize not only their own lives but the lives of their drivers and of passers by in the narrow and winding mine roadways.

As for the table on power-plant equipment given in the bulletin, the classification of boilers into cylindrical and tubular is insufficiently complete and seems a relic of earlier conditions and older statistical tables. If we cannot have names of boilers and must be general in our listings, and such generalizations have their advantages, let us list the boilers as flueless, nontubular boilers, fire-tube boilers, water-tube boilers and then let us have some divisions based on the method of firing—by hand, by automatic stoker, or with powdered fuel. It would be well also to obtain some information regarding the use of ropes for haulage. It seems incongruous to ask about the number of horses and mules engaged and to inquire about the number of locomotives of four principal types—gasoline, steam, compressed-air and electric—and then ask no questions as to the number of hoists in shafts, entry and room haulage. Furthermore, the trolley locomotive should be differentiated from the storage-battery locomotive, the reel locomotive and the combined battery-and-trolley locomotive.

The cylindrical boiler, or flueless nontubular boiler, is an obsolete type. Bold and enterprising explorers in the anthracite region, it is said, can surprise such rare birds in covey, when the game wardens are not watching, but we understand that in no other coal regions have these early fuel wasters been able to resist the progress of industry and perpetuate their existence. In justice to the anthracite region, it must be admitted that the cylindrical boilers are only stand-bys to be used in emergencies when floods make the draft on the standard colliery equipment more than usually heavy.

# DEPARTMENT OF HUMAN INTEREST

## Kansas Has School for Mine Workers

Night courses, especially adapted to the needs of bituminous coal mine workers in the Pittsburg (Kan.) coal fields, have during the past fall and winter brought to these men a technical knowledge of mining methods which will, it is hoped, result in the greatest output of coal with the least waste of life, machinery and effort.

These courses have been given in classes of from 25 to 50 men to a class in various cities and towns throughout this field. The instruction has been given by Prof. J. A. Yates, head of the Department of Physical Sciences, and Prof. J. A. G. Shirk, head of the Department of Mathematics of the Kansas State Manual Training Normal School at Pittsburg.

The courses have been arranged so as to give the mine worker just the instruction necessary to more fully develop the art of scientific mining. Many of the men are miners of long experience, yet they have performed their work with little understanding of the principles of scientific mining, which include the study of gases, the causes of spontaneous combustion, ventilation, the causes of explosions, haulage, the analysis of air, humidity and various other subjects of real value in lessening the probability of explosions with their consequent loss of life.

This instruction has been given by Professor Yates, who met his classes at stated times in the various towns in the vicinity of Pittsburg, where large mines and strip pits are located. The courses are not exclusively limited to actual coal mining, but include a thorough study of machinery in and around the mine, comprising steam engineering in all its branches, fuel economy, draft control, boiler construction, safety appliances, lubricants, cable tests, safety catches, signals, valve setting and other important phases of efficient engineering. Professor Shirk gave this instruction, meeting his classes each week.

When the present war made imperative the greatest possible production in all lines of industry, President W. A. Brandenburg, of the Kansas State Manual Training Normal, determined that the school should be made of the greatest possible value to the nation in the crisis. He felt this could best be done by giving laboring men a scientific knowledge of their work. Being located in the heart of a large coal field, it was at once evident that this object could in no way be better accomplished than by offering special courses for miners, stationary engineers and firemen, thus enabling them to maintain a maximum production of coal with the least waste.

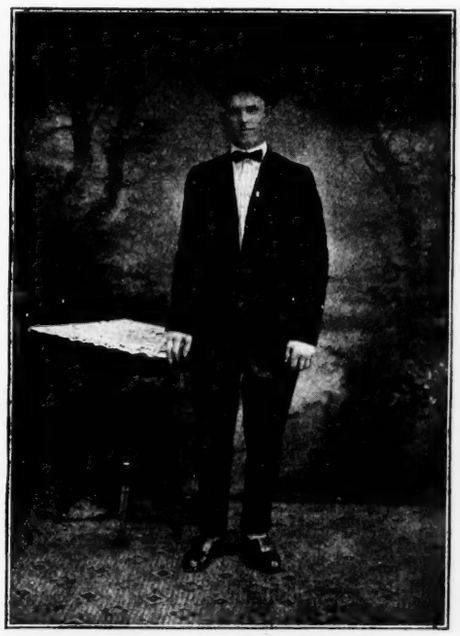
In consequence of this determination the following cities and towns in the coal field were visited and miners' night classes organized: Mulberry, Arma, Ringo and Scammon. The school being centrally located offered an excellent place for such classes, and many miners and engineers have evinced much interest in the movement. In consequence of the training the Kansas field is becoming a greater asset to the nation at war. Professor Yates' courses are planned to develop a habit of coördinating the work of brain and hand, thereby improving working conditions in the mine, insuring better health to the miners, and making the miner's lot a happier one. The courses also give information which if utilized will reduce the number of accidents in the mines.

Miners and engineers of many nationalities and of varying ages have enrolled in these courses. After a day spent in the mines at laborious work, it is no small effort for these men to spend an evening in study, but so eager are they to become of the greatest value to the nation in this present war crisis that attendance during the term now drawing to a close has caused President Brandenburg, Professor Yates, and Professor Shirk to plan already for a still greater, wider and successful effort in this line during the coming school year.

A CLASS OF MINE WORKERS AT RINGO, KANS., WHO ARE STUDYING THE MYSTERIES OF THEIR EMPLOYMENT
They believe that the art of mining needs study as much as the art of farming or of any other industry

# Contributed 508 Tons in One Month to Beat the Hun

**An Ohio Miner of American Birth loads 508 Tons of Entry Coal in Month of May**



**In 22 Working Days of 8 Hours. Coal only 3 feet 8 inches high and Entry 15 feet wide.**

Ed Blagg, a loader in No. 1 mine of the Buckeye Coal and Railway Co., San Toy, Ohio, averaged 23 tons per day during the whole month of May, working every day he had a chance. This is about 3 tons for every working hour or one ton every 20 minutes.

Blagg is of draft age, and he is ready any time to be called; meanwhile he intends to help in the war by mining all the coal he can. He is 27 years old, married and has one child. He is of American ancestry, being born and raised near Ironton, Ohio. He has contributed liberally to the Red Cross and Y. M. C. A. and bought $100 of War Savings Stamps.

Joe Swagda is his nearest rival. He loaded 462 tons in May and has subscribed liberally to all war activities. The miners of San Toy have already bought $21,000 worth of War Savings Stamps.

# DISCUSSION BY READERS

## Carbide vs. Electric Mine Lamps

*Letter No. 1*—I have read with interest the article "Electric Lamps in Nongaseous Mines," *Coal Age*, Feb. 2, p. 239, by George H. Deike. As this article has evidently been prepared and submitted in the interest of electric mine lamps, in disparagement of the popular carbide lamps, I am led to offer a few comments in justification of what I claim is an ideal lamp for use in nongaseous mines.

In the first place, would not the ordinary precaution of testing for gas by a protected safety lamp of an approved type have prevented the gas explosions mentioned as occurring in the Cleveland water tunnel, the Michigan copper mine and the salt workings near Ithaca, N. Y.? If, as Mr. Deike states, the presence of gas may be looked for in such operations, it would appear readily possible to detect it and guard against such accidents by an ordinary fireboss test with any approved safety lamp.

Of the eleven points of advantage claimed by Mr. Deike for the electric lamp, with the exception of the first two, every one may be claimed for the carbide lamp with equal or even greater force. As an offset to those two, may be set forth the detection by the flame of the carbide lamp of an atmosphere deficient in oxygen content, which is obviously impossible with the electric bulb; and fatalities due to this cause have not been unknown.

### ADVANTAGE AND SAFETY OF THE CARBIDE LAMP

With regard to fires caused by open lights, Mr. Deike has failed to differentiate between the carbide flame, with its tiny pencil of burning gas, and the old-fashioned oil torch, with its large wavering flame, falling sparks and burning wicking. Tests made by one of the largest anthracite companies some years ago on what may be termed the relative "zone of inflammability," as between oil and carbide lamps, thoroughly established the great difference between them, and caused the recommendation of the latter as an eminently safe illuminant, with reference to fire risk.

Referring to the extinction of lamps by air currents, Mr. Deike is possibly not aware that the development of the art has produced an attachment for carbide lamps, which will hold the flame in the strongest air current met with under working conditions. Relighting devices have also been perfected that make the relighting of the lamp very simple and quickly accomplished.

A similar criticism may be made of Mr. Deike's conclusion regarding the time lost in adjustment and regulation of lamps. While his statement may be correct as to conditions of a few years ago, improvement in manufacture has now reached a point where the carbide lamp is practically self-regulating; and, with ordinary care, may be depended on to give a satisfactory working light, with little or no adjustment.

On the question of operating cost, Mr. Deike's figures are not altogether convincing. He has complacently pigeon-holed the two interesting items of first cost and depreciation; and has assumed a minimum figure for carbide (again classing it with oil) of from 6 to 7c. per shift. I can offer as against this an actual cost for carbide of 2½c. per eight-hour shift, based on figures submitted to me by a leading anthracite company.

In conclusion, let me say that I have no desire to urge the use of carbide lamps in any mine where there is the slightest doubt of their safety. It has been my practice for years, in cases of this kind, to recommend the use of electric and safety lamps, but in reading Mr. Deike's article I feel that he has done scant justice to the real merits of the carbide lamp, in its own particular and well-recognized field; and I wish definitely to enter my protest to some of his conclusions.

Scranton, Penn. FRANCIS H. COFFIN.

## Surveying and Mapping

*Letter No. 7*—In discussing this subject in *Coal Age*, not long since, little or no mention was made in respect to the character of mine maps. The mine map is the chief and generally the only means of recording the information relating to the shape, extent and condition of the workings underground. Notwithstanding this fact, it is too often neglected.

Most states require that an accurate survey shall be made and platted to a given scale, at stated times, so as to insure a complete record of the excavations made beneath the surface being always available for future reference. Such a record has often proved of the utmost importance, both in respect to surface damages that sometimes ensue, and as affording an accurate knowledge of the proximity of old and abandoned workings, in the development of adjoining properties.

### THE COMPLETE MINE MAP

For completeness of information, the mine map should show fully the surface plant and should include the boundary lines of all properties owned or leased by the company, the location of such physical features as lakes and water courses, together with all surface improvemnts, such as railroads, highways and buildings. The surface plant should be laid out in detail and show the tipple and various buildings, supply yards, reservoirs, pipe lines and drains, together with the location of the mine openings and the outcrop, if any, of the coal.

The underground workings or mine plan may be drawn on a separate sheet; but this is frequently combined and drawn on the same sheet with the surface plan, which enables a closer inspection and reference to be made in determining the relation of the underground workings to the surface features. The under-

ground plan is a projection on a horizontal plane. The plan should show the mine openings, shafts, slopes or drifts, and all airways, roads and passageways in the mine, together with all pumprooms, enginerooms, stables, tool shanties and other openings driven in the seam, besides the many working places in the mine.

The plan should also show the location of all faults and other disturbances or irregularities of the seam, together with information regarding the dip or pitch of the seam, thickness of the coal and the advance of the working face from year to year, as determined by each successive survey. The position of all drillholes should be marked on the map together with the depth of the hole, or the elevation of the seam at that point, and the thickness of the coal. This will enable the work of development to be carried forward intelligently.

### Additional Information on Mine Maps

In addition to the surface and underground plans, there are often required longitudinal and transverse sections. The former may be either a vertical section or one lying in the plane of the dip. The latter is usually platted on a plane at right angles to the former. Certain geological data relating to the changes of dip and strike are important in the future development of the mine, particularly when contiguous seams are worked at the same time or through the same opening. All plans should be made, as far as practicable, on the same scale, which will facilitate their reading. The ground plan should show fully the direction of the ventilating current. Complete mine plans are of the greatest importance in case of an explosion or other mine disaster.

In the case of a mine explosion or serious disaster, many of the rescuers who flock to the mine to offer their aid are wholly unacquainted with the underground workings and the ventilation of the mine. It is on such occasions that the need of an accurate map showing all the underground features, including the ventilating current, doors, stoppings, air bridges, etc., is absolutely essential in order to cope efficiently with the disaster. All mine maps should be dated and signed by the engineer or surveyor who took and plotted the notes and who is responsible for their correctness.

Golden, Colo. Fred L. Services.

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# Pillar Workings

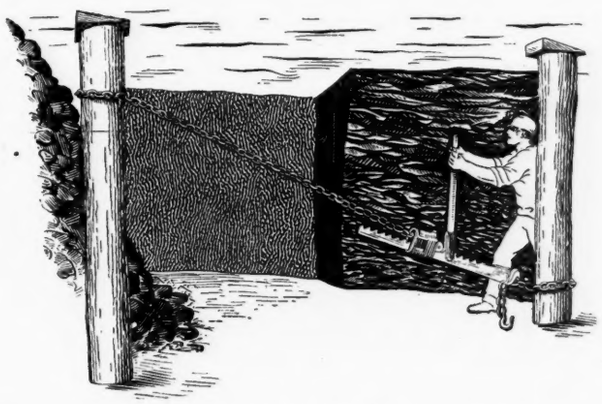
*Letter No. 1*—Like many other mine officials confronted with the problem of safe pillar drawing, I have given much attention to this feature of coal mining. The numerous references made to this class of work, in *Coal Age*, and particularly the letter of W. H. Noone, which appeared in last week's issue, June 29, p. 1210, tempt me to give a few of my own impressions regarding the recovery of timber in pillar workings.

The records for the year 1915 show 934 fatalities inside the mines of Pennsylvania. Of these 527 occurred in the anthracite and 407 in the bituminous region. Of the 407 lives lost in bituminous mines, 78 were due to falls in pillar workings, which is a large percentage considering the comparatively small number of men employed in that work. In his classification of mine accidents, Mr. Noone makes no direct mention of those that occur in the drawing back of pillars, although he probably includes these under the head of "falls of rock and coal."

Recovering timber by hand with the aid of an ax or sledge is dangerous work, in spite of every precaution that may be taken by experienced men. It seems strange that with the adoption of mechanical appliances, in practically every branch of mining work, the custom still prevails of knocking out posts with a hammer or ax and taking the chance of being caught under the fall of roof that is liable to follow.

As a safety measure in the drawing of timber, a mine official is often instructed to supervise the work, although it is generally the case that the men in his charge are as practical as himself. For this reason, the measure adopted can hardly be considered as a safety measure. A real safety measure would be the adoption of a mechanical post puller that would enable the men performing the work to stand beyond the danger zone while thus engaged.

One of the most practical devices of this nature is the Sylvester device, sometimes called the "Sylat post puller." The accompanying figure illustrates the practical use of this device, in the drawing of timber in



DRAWING TIMBER IN PILLAR WORKINGS

pillar workings. By its use, the man performing the work is protected against any possible fall of roof, and accident from this cause is avoided.

It is a theory of mine that a number of roof falls occur, particularly in pillar workings where there is apparently no actuating cause, and that these may be due to a vibration set up by a vibrating sound that is properly attuned. The boulder that falls from the roof may be large and weigh, say 100 tons and yet have been so balanced that it required but a vibration to throw it out of poise.

The singing of a man with a powerful voice has been known to break a fragile vase. The same singer, by the vibration set up by his voice, caused a glass of water to spill. It seems to me that it is not impossible that such innocent causes may act to produce a fall of roof in the mine, in certain instances.

In pillar workings, when the coal has been taken out, the roof naturally rests on the timbers and is often in a balanced condition that requires but a slight cause to make it fall. There are many vibrating causes occurring in the working of a mine, and this condition alone emphasizes the need of adopting a device or method that would place the workmen out of harm's way when drawing timber.

In studying over this question, under varying conditions, it has occurred to me that when the pillars are mined with a shortwall machine it is possible to make use of the feed-line of that machine for drawing timber. The feed-line is of ample strength to withstand a hard pull, as it is ⅜ in. in diameter. Also, since it is generally 40 ft. long, there will be no difficulty in reaching any timbers that it is desired to pull and still keep the machine in a safe place.

After fastening the line to the timber to be drawn, the machine could be moved back along the track, by its own propelling power, and this will generally result in pulling out the timber. However, should the timber resist the movement of the machine and cause the wheels to slip on the rails, it is possible to brace the machine and apply the power to the feed-drum. But this will only happen when the timber is so banked with slate as to give it greater resistance to the pull. It often happens that when a post is knocked out by hand it is covered up and lost by the fall. This cannot occur ordinarily when the post is drawn by any mechanical device such as I have described.

———, Penn. ROBERT LITTLEHALES.

# Mine-Rescue Work

*Letter No. 1*—When is a man brave and when is he foolhardy in the face of danger, and what is the dividing line; or is that a matter of individual judgment? I am led to ask these questions after reading the incident cited at the close of Fred B. Hicks' letter on "First Aid to the Uninjured," *Coal Age*, June 1, p. 1029, when 13 men lost their lives in a fruitless attempt to recover the bodies of two of their comrades killed by an explosion in the mine workings.

We have had, in the history of mining, many sad catastrophes and, no doubt, will have more in the future; but the saddest of all is the fate of many heroic rescuers who sometimes, without precaution, rush to the aid of their less fortunate fellow workers.

### LESSONS TAUGHT BY PREVIOUS MINE DISASTERS

Speaking for myself, the lesson of taking many precautions in attempting rescue work was learned at the terrible Harwick mine disaster, which occurred at Cheswick, Penn., Jan. 25, 1904, and resulted in the loss of 178 lives. Immediately following that explosion the mine fan was repaired and an exploring party went down in a hoisting bucket, as the cages had been blown out of the shaft by the force of the blast. The rescuers followed the air into the mine, but in their eagerness to reach any men who might have survived the explosion, they failed to notice one place where the air was short-circuited. As a result, the leader of the party, who was my first engineering employer, lost his life in the afterdamp into which they plunged.

Who that is interested in coal mining fails to recall the sad result of the brave attempts made to rescue the unfortunate men trapped in the Cherry mine, in Illinois, when a fire occurred in that mine, at noon, Nov. 13, 1909, and 259 lives were sacrificed as a result? Volunteering for rescue work, a party of trained, professional men, and miners who worked on the night shift, were lowered to the first level and succeeded in saving many half-suffocated miners.

Before long, however, the shaft bottom became untenable by reason of the great heat and the rescuers were forced to get on the cage to be hoisted to the surface. My information is that, through a misunderstanding in the signals given, the cage was hoisted but a few feet above the bottom, where the men were burned to death.

At the Port Royal disaster of June 10, 1901, Port Royal, Penn., a party of 15 rescuers lost their lives in a venturesome and vain attempt to recover the bodies of four men who had been sent into the mine that night to do some bratticing. The men continued to advance, notwithstanding they had been warned of the conditions existing at the place by others who had attempted the rescue and were forced to return.

### ORIGIN OF THE "SAFETY FIRST" SLOGAN

Most of our large mine disasters might have been prevented had their methods of operating been changed and certain precautionary measures employed. I recall a terrible explosion that occurred in the early nineties, whereby one of the largest coal-producing companies in the country learned a lesson that resulted in the adoption of the slogan "Safety the first consideration." Safety rules and regulations were posted and enforced in all their plants.

The company operated scores of the deepest and most gaseous mines in the bituminous coal fields, and were pioneers in the great safety-first campaign that followed. The record of that company since is absolutely clean and free from disasters, and the rules and methods they adopted at that time are the foundation of our present state and insurance regulations.

### RESCUERS LOSE LIVES IN RECENT DISASTERS

At Villa, W. Va., May 20, this year, a fire occurred in the mine of the Mill Creek Cannel Coal Co., costing the lives of 14 men. In the attempt to rescue the men entrapped in the mine, seven of the rescuers were overcome by the fumes and gases of the fire and were, with difficulty, resuscitated. An item regarding this fire appears in *Coal Age*, June 1, p. 1033, and a fuller account of the disaster is given in the same journal, June 15, p. 1106.

Only a few days ago, a series of terrific explosions extending over a period of five hours ruined a high-explosive manufacturing plant a mile and a half from here and caused a death list of between 100 and 200 men, many of whom were rescuers. Three of our men living in that vicinity assisted in the work of rescue.

Hurrying to the scene, I assisted in removing possibly 30 badly maimed and injured men to the nearest physicians. The plant lay in a deep valley and covered about 15 acres. In our work we were partially protected by a projecting spur of the hills from the force of following explosions, which killed many of the rescuers who were less fortunate.

While thus engaged, two terrific explosions occurred about 10 min. apart, throwing flaming acids hundreds of feet into the air. Having finished our work in that vicinity and being informed that there were thousands of pounds of the highest known explosives that would shortly be reached by the fire, we left the place and an hour later this last heavy explosion occurred, killing many rescuers, among whom was one of our

own employees who had volunteered but two minutes before the blast occurred.

Miners, as a class, are noted for their bravery in the face of danger and are often assigned to the most important work on such occasions. It frequently happens that the best judgment of rescuers is biased by the wails of women and children whose loved ones are in danger. To enter a mine ahead of the air is nearly always fatal, as a second explosion may often occur when fresh air is forced into the workings and mixes with the accumulations of heated gases, or forces fresh gases over a fire smoldering in the debris.

While breathing apparatus can often be employed with advantage when exploring a mine ahead of the air, or in fighting mine fires, it is generally the case that where the mine air is sufficiently foul to require the use of breathing apparatus it is too foul to support life, and there is little hope of rescuing men by this means.

Artificial resuscitating appliances also have their uses. If I am correctly informed, however, a number of deaths have occurred within the last few years from respiratory diseases, after such resuscitation. While we should always desire brave men for rescue work, they must not be foolhardy, but take every precaution to avoid unnecessary danger. J. S. GELSTON.

Noblestown, Penn.

## Sealing Off Fire on Intake

*Letter No.* 1—Permit me to refer to the inquiry of "Ancora," *Coal Age*, June 22, p. 1173, regarding the sealing off of a fire on the intake side of a pair of headings. The inquiry assumes there are no rooms on these headings and that only a small quantity of gas is generated, making safety lamps unnecessary, and asks for the proper order of building stoppings to seal off the fire.

The danger encountered in performing this work arises from three causes: (1) The formation of an explosive mixture of marsh gas and air at the face

STOPPING OFF FIRE ON INTAKE AIRWAY

of the heading. (2) The generation of carbon monoxide in the region of the fire when the supply of air has been limited or cut off by the building of a stopping. (3) The ill-effects experienced by the workmen in the return airway, due to the gases generated by the fire.

In discussing this question, let me say that my experience has taught me that there is more danger to workmen required to work on the return airway after the supply of air to the fire has been partially cut off. The limited air supply results in the production of carbon monoxide, which is extremely poisonous.

I remember, on one occasion some years ago, that it was necessary to repair a couple of stoppings, which had been built to seal off a fire and were leaking. The men doing the work were quickly seized with violent headaches and palpitation of the heart. On another occasion, we were able to put out a fire that was not sealed off but had a plentiful supply of air and the workmen suffered no ill-effects from the gases generated.

### BUILDING THE STOPPINGS

With this explanation, I want to outline my method of proceeding to seal off this fire. Referring to the accompanying figure, I would open up the stopping at *A* sufficiently to short-circuit a portion of the air, before starting to build the first stopping on the intake, which should be placed as near as practicable to the fire. At the same time, starting from the outby rib of that crosscut, on the return side, I would extend a line of brattice up the return airway toward the face. Carrying sufficient fresh air with me, I would extend this brattice through the inby crosscut at *B* and carry it up to the face of the intake heading, as shown in the figure.

If necessary, I would do the same on the return heading, so as to avoid any accumulation of gas at the faces of these headings. The smoke and gases from the fire would pass out on the return side of the brattice. In the meantime, the building of the stopping on the intake has proceeded. When that is finished all of the air will be short-circuited at *A* and carried by the brattice to the face of each heading.

The stopping on the return heading is now started at *C*. As work on this stopping progresses and nears completion, a portion of the air can be short-circuited at *A* and permitted to pass out of the mine on the return airway. It should not be difficult to build a stopping on the return with a canvas brattice running up the entry in the manner indicated. A piece of pipe should be built into each of these stoppings and provided with a valve or plug to permit the air to be tested, from time to time, to ascertain the progress made in the extinction of the fire. When building the brattice, frequent tests must be made of the air on the return side.

Thomas, W. Va. W. H. NOONE.

## Interpreting Mining Laws

*Letter No.* 4—Referring to the interesting question raised by Charles Martin, *Coal Age*, June 8, p. 1080, I understand the meaning of the Pennsylvania Bituminous Mine Law to be that crosscuts, in room pillars, shall not exceed 35 yd. or be less than 16 yd. as stated in Art. 9, Sec. 3; while the same law, in Art. 6, Sec. 4, permits a distance of 200 ft. between crosscuts, in entry pillars.

Although the law does not so state, specifically, it is my opinion that the latter provision has reference to nongaseous mines only. Likewise, I believe that the longer distance of 35 yd., in room pillars, applies to nongaseous mines only, while a shorter distance, not less than 16 yd., refers to gaseous mines.

The specifying of shorter and longer distances, depending on the condition of the mine with respect to gas, makes possible a great saving in yardage on the entries, as well as the strengthening of the pillars in both rooms and entries, when the conditions permit the driving of crosscuts further apart as described by law.

It would seem to me that this is the proper interpretation of the law and that most practical mining men

would take this to be the intention of the law makers. The mine foreman is able to determine when the crosscuts can be driven at a greater distance and when this distance must be decreased in order to keep the face of the heading clear of gas, and this is left wholly to his judgment.

Referring to the question asking at what point the air current should be termed "return air," in the meaning of the law, Art. 9, sec. 1, reads, "The return air from each split where from 70 to 90 persons are employed shall be conducted by an overcast or an undercast into the return airway, which shall lead to the main outlet."

I take this to refer to the last crosscut in each split or section of the mine. From the mouth of the split, the air current is conducted through the workings on the intake airway and, on reaching the last crosscut, passes into the return. From this point until it reaches the overcast and is conducted by the main return airway out of the mine, the current is called the "return air."

In closing, permit me to say that 200 ft. is too far apart to drive crosscuts, without the use of a brattice to conduct the air to the face of the heading. Such a distance is too far for men to work ahead of the air. The brattice should extend to within 20 or 30 ft. of the face of the heading. These are important questions in mine ventilation, and I hope to see them fully discussed.

Worley, Ky. OSCAR JONES.

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*Letter No. 5*—The recent discussion that followed the inquiry regarding the provisions of the Bituminous Mine Law of Pennsylvania, in respect to ventilation, which appeared in *Coal Age*, June 8, p. 1080, interested me greatly. This discussion showed the need of clearly understanding the meaning of the law, to do which one must read carefully the entire statute bearing on the points in question.

Referring to the question regarding the distance apart of driving breakthroughs in room and entry pillars, it is true that Art. 9, sec. 3, provides a maximum distance of 35 yd. and a minimum distance of 16 yd., in all room pillars, and makes no mention of entry pillars. In the same connection, attention was drawn to the reading of Art. 6, sec. 4, which states, "said entries shall be separated by pillars of coal of sufficient strength, and shall not be driven more than 200 ft. beyond the last cut-through, except for exploratory purposes."

Let us look, for a moment, however, at Art. 4, sec. 2, the second paragraph of which reads, in part, as follows: "He shall also see that proper cut-throughs are made in the pillars of all rooms and of all entries, in accordance with sec. 3 of Art. 9 of this act, and that they are closed when necessary so that the ventilating current can be conducted in sufficient quantity through the last cut-through to the face of each room and entry by means of check doors."

It is clear that the reading of this section makes the provision of Art. 9, sec. 3, to which we have just referred and which is here particularly mentioned, apply to both room and entry pillars, notwithstanding the fact that entry pillars are not mentioned in that section of the law.

In my opinion, the Bituminous Mine Law of Pennsylvania does not permit breakthroughs in entry pillars to be driven 200 ft. apart, except in the special instance to which reference is made in Art. 6, sec. 4. In order to understand this reference, it is necessary to read the entire section. In doing so, we find that this section refers to the driving of the main entries, from the first and second openings, in new, gaseous and nongaseous mines, providing further for mines opened as nongaseous but in which gas has appeared later.

### LAW REGARDING MAIN ENTRIES

This section of the law provides for the driving of at least four main entries, two of which shall lead from the main opening and two from the second opening, into the body of the mine, in all mines generating gas in sufficient quantity to be detected by an approved safety lamp. In mines where locked safety lamps are used exclusively and a large acreage is to be developed, requiring a length of 5000 ft. or more on the main entry, this section prescribes the driving of at least five entries, two connecting with the main opening and two with the second opening, while the fifth entry is to be used as a travelingway.

The law is very specific and provides, likewise, in nongaseous mines, for at least two main entries, one leading from the main opening and the other from the second opening, into the body of the mine; except where a large acreage is to be developed, requiring a length of 5000 ft. or more on the main entries, in which case the law specifies that three such entries must be driven, one for use as a travelingway only.

Following this reference, the section states "Said entries shall be separated by pillars of coal of sufficient strength, and shall not be driven more than 200 ft. beyond the last cut-through, except for exploratory purposes." I understand this to refer to the thickness of coal that must be left as a barrier against a possible accumulation of gas or water beyond these headings, since the law provides (Art. 4, sec. 2) that no rooms shall be turned in advance of the last cut-through, thus insuring a solid pillar of coal beyond that point to the head of the main entries, except as the latter are extended for exploratory purposes.

### WHAT CONSTITUTES A "RETURN AIRWAY"

The question of what constitutes a return airway should present no difficulty to the practical mining man. In regard to the gob section, mentioned in the inquiry to which I have referred, and lying between two live sections ventilated by a single current, such an arrangement would seem to be contrary to the reading of Art. 9, sec. 1, which requires the ventilation to be conducted through the entries and to all working places "in sufficient quantities to dilute, carry off and render harmless the smoke and dangerous gases generated therein, to such an extent that all working places and traveling roads shall be in a safe and healthy condition for the persons working and traveling therein."

It would not be possible to comply with the law were the ventilating current permitted to pass through a gob section and be then conducted into live workings. In such a case, the ventilation should be so arranged, by the building of an overcast, that the current after passing through the gob section would be conducted immediately into the return airway and pass out of the mine.

Leckrone, Penn. M. H. G.

# INQUIRIES OF GENERAL INTEREST

## Overcome on Reaching Fresh Air

An instance of men being overcome on their return to fresh air, after inhaling bad air in their working places for a considerable period, was brought to my attention sometime since. It has caused me much thoughtful reflection and I have often wondered if my conclusion in regard to the cause is correct. The facts as they were told me are as follows:

In a certain mine in this state, the men working in one section found the air in their places rather heavy one morning when starting for work. Owing to a door having been left open during the night, the ventilating current had been cut off from that section and the air was bad. Closing the door, the men proceeded to their work; but it was not long before they began to realize that something was wrong. There was a growing feeling of depression and all decided to quit work and go home, which they did without further delay.

Reaching the fresh air that was traveling on the main intake airway, the men were quickly overcome and fell unconscious in the entry. Here they laid for a short time when consciousness again returned and they were revived by breathing the pure air passing.

Studying over these facts as they were told to me, I concluded that the men were overcome by breathing a small percentage of carbon monoxide, which I assumed had accumulated in their working places. I understand that the symptoms resulting from carbon monoxide poisoning are somewhat as follows: tendency to dizziness, palpitation of the heart, shortness of breath, drowsiness, weakness of the limbs and final loss of consciousness. Later, conversation with the men convinced me that they had experienced all of these symptoms. Still, I am not confident that this is the real cause of the loss of consciousness when the men reached fresh air, and I shall appreciate being better informed on the matter.

Springfield, Ill. ASSISTANT SUPERINTENDENT.

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There is no ground for supposing that the men, in this case, were overcome by breathing carbon monoxide. Had such been the case, they would have fallen unconscious in their places and not been able to reach fresh air. The occurrence may be explained as follows:

The cutting off of the circulation in that section of the mine, by the setting open of the door the night before, caused an accumulation of blackdamp in the working places. Shortly after starting to work, the men felt a dizziness and shortness of breath and very wisely decided to withdraw from the place.

Experiments have shown that there is an automatic regulation in the process of breathing air containing small percentages of carbon dioxide, whereby the percentage of this gas remaining in the lungs is maintained practically constant, averaging about 5.6 per cent. The breathing of air containing a greater proportion of this gas automatically causes a deeper inhalation followed by panting, due to the effort made to throw off the excess of gas from the lungs. The labored breathing causes palpitation of the heart and a rush of blood to the head, producing dizziness.

In this condition and with their lungs holding an excess of carbon dioxide, these men reached fresh air. But, the result of inhaling pure air when the lungs are partly filled with gas is to cause a temporary suspension of breathing and a state of coma or insensibility follows. The effect, however, is only temporary and in a short time the action of breathing is resumed.

This condition has often been observed upon bringing men who have been exposed to gas, to the surface. The victims will frequently lapse into unconsciousness in the cool, pure air, and this we assume was the case in the instance mentioned by this correspondent. Similar instances can probably be cited by readers of *Coal Age* in their varied experiences in coal mining.

## Travel of Electric Current

Kindly explain the manner in which a current of electricity travels in a wire conductor. Does the current flow over the surface or through the wire; and, if both, does the same quantity pass through the wire as over its surface?

Benham, Ky. STUDENT.

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This is a mooted question, in regard to which electricians have held different opinions. Formerly, many were led to believe that an electric current flowed over the surface of a conductor rather than through its body. We believe the prevailing opinion, at the present time, is that it is more probable that the entire body of the conductor is permeated with the current to a greater or less extent, but in what proportion it is impossible to state.

Referring to tables giving permissible capacities of wires of different diameters and of like material, as established by underwriters, it appears that the allowable current capacity of insulated wire conductors (which is an index of the heating of the wire by the passage of the current) varies as the square root of the cube of the diameter of the wire. For example, a wire having twice the diameter of another wire has a permissible current capacity of $\sqrt{2^3} = \sqrt{8} = 2.8$ times the capacity of the second wire.

While the connection between the size of a wire conductor and the heating caused by the current passing through it is not simple, the observed relation here expressed would seem to suggest that the mass of the wire is involved or concerned in the passage of the current. This relation does not appear to support the idea that the current flows over the surface of the conductor only.

*Coal Age* will be glad to have some of its readers who are expert electricians throw any new light on this subject that experimental investigation may afford.

# EXAMINATION QUESTIONS

## British Columbia Examination, First Class, May 14, 1918

*(Selected Questions)*

*Ques.*—Under what conditions may afterdamp become explosive?

*Ans.*—The afterdamp of a mine explosion may, and often does, contain unburned marsh gas, which becomes explosive on the addition of fresh air. The afterdamp may also contain sufficient quantities of carbon monoxide and fine dust floating in the air to render it explosive in the presence of fresh air. On this account great caution is needed when an exploring party enters the mine after an explosion has occurred therein.

*Ques.*—At the same temperature and pressure, which is the heavier, dry air or the same volume of air fully saturated with moisture?

*Ans.*—Air containing moisture is always lighter than dry air, bulk for bulk or volume for volume, because the density of the water vapor in the air is less than that of the air itself. The weight of water vapor is about five-eighths of that of the same volume of dry air, at the same temperature and pressure.

*Ques.*—With a barometric pressure of 30 in. and a temperature of 60 deg. F., (a) what effect would be produced on a given volume of air if the barometer should fall to 29.5 in.? (b) What change in temperature would be required to maintain a constant volume of air under this fall of barometer?

*Ans.*—(a) Assuming a constant temperature, a fall of barometer from 30 in. to 29.5 in. would cause an expansion in the volume of a given weight of air. In other words, for a constant temperature, the volume ratio is equal to the inverse pressure ratio. Hence, in this case, the ratio of increase in volume would be 30: 29.5 = 1.017. That is to say, 1000 vol. of air at 30 in. barometer would be increased to 1017 vol. when the barometer falls to 29.5 in., temperature constant.

(b) In order to maintain a constant volume in a given weight of air, the absolute temperature of the air must vary as the barometric pressure. In other words, the absolute-temperature ratio must equal the barometric ratio, which gives, in this case, calling the required temperature $x$,

$$\frac{460 + x}{460 + 60} = \frac{29.5}{30}; \text{ or } \frac{460 + x}{520} = 0.983$$

$$x = 520 \times 0.983 - 460 = 51+ \textit{ deg. F.}$$

That is to say, to maintain a constant volume in a given weight of air when the barometer drops from 30 in. to 29.5 in., the temperature must drop from 60 deg. to 51+ deg.

*Ques.*—If a certain pressure produces 20,000 cu.ft. of air per min., in an airway 6 ft. in diameter, what quantity of air will the same pressure produce in an airway 12 ft. in diameter, assuming the airways have equal lengths?

*Ans.*—In the ventilation of circular airways, for the same pressure, the volume of air in circulation varies as the square root of the fifth power of the diameter of the airway. In other words, the volume ratio is equal to the square root of the fifth power of the diameter ratio, which gives, in this case,

$$\frac{x}{20{,}000} = \sqrt{\left(\frac{12}{6}\right)^5} = \sqrt{2^5} = \sqrt{32} = 5.657$$

$$x = 20{,}000 \times 5.657 = 113{,}140 \textit{ cu.ft. per min.}$$

*Ques.*—The total rubbing surface of a square airway being 160,000 sq.ft., the length of the airway 5000 ft., and the quantity passing 80,000 cu.ft., find the velocity of the air current in feet per minute.

*Ans.*—The perimeter of this airway is 160,000 ÷ 5000 = 32 ft. Since the airway is square in section, the length of each side is 32 ÷ 4 = 8 ft.; and the sectional area is therefore 8 × 8 = 64 sq.ft. The velocity of the air, in this case, is, then, 80,000 ÷ 64 = 1250 ft. per minute.

*Ques.*—Explain the meaning of the term "manometrical efficiency," as used in fan ventilation, in estimating the efficiency of a fan.

*Ans.*—Manometrical efficiency is an expression indicating the ratio of the effective pressure due to the action of the fan, to the theoretical pressure or head of air column derived from the formula, $h = u^2/g$. The term has no practical value in estimating the efficiency of a fan, for the reason that the pressure a fan will create is determined by the resisting power of the mine. For this reason, the efficiency of the fan estimated on this basis will vary when operating on different mines.

*Ques.*—What must be the sectional area of a square airway that is required to pass 50,000 cu.ft. of air per minute under a 1-in. water gage, the length of the airway, including the return, being 1 mile?

*Ans.*—The airway being square, the length $d$ of one side is calculated thus,

$$d = \sqrt[5]{\frac{4klq^2}{p}} = \sqrt[5]{\frac{4 \times 0.00000002 \times 5280 \times 50{,}000^2}{5.2}} = 11.5 \textit{ ft.}$$

The sectional area of this airway is therefore $11.5^2$ = 132+ sq.ft.

*Ques.*—If the ventilating machine was permanently disabled by an explosion of firedamp, what temporary means would you employ to restore ventilation in the mine?

*Ans.*—At all gaseous mines, provision should be made for such an emergency, by the installation of a second fan that can be brought into immediate use should occasion demand. However, in the absence of such extra equipment and temporary repairs being impossible, it will be necessary to improvise some means for producing circulation of air in the mine. The means most effective and convenient is a steam jet placed in the upcast shaft. A fire basket hung in the shaft would be dangerous.

# COAL AND COKE NEWS

## Harrisburg, Penn.

According to figures compiled by the Central Pennsylvania Coal Producers Association, coal production in the central district is steadily increasing. The total for the month of June will not be far from 4,500,000 tons, making June the banner month of the present year. Production is still curtailed to some extent by car shortage, but not seriously.

The production for the week ending June 15 set a record, as 1,166,752 tons were turned out. The week ending June 8 was not far behind, with 1,166,494 tons, while the week ending June 15 showed a production of 901,839 tons.

The loss in production for the week ending June 15, because of inability to obtain cars, was 38,933 tons, while the loss for the week ending June 8 was 16,465 tons; for the week ending June 1 it was 14,359. Cars are equitably distributed among the producers, and thus none derives an advantage at the expense of the others, and the labor problem is in a fair way of being permanently solved.

It has been agreed among the miners and producers that production in the soft coal fields can be increased without resorting to either conscription of labor or lengthening of the working day. The miners are making good wages and there is little dissatisfaction.

The famous barrier pillar between New Boston and Mill Creek collieries, which contains half a million tons of coal, is to be mined. Court was informed during the week that the litigation which has been in progress twelve years to maintain this great pillar is ended.

The trouble began when the late John Curran, mine inspector of the 18th anthracite district, got an injunction against the coal companies to prevent the removal of the pillar, as otherwise the lives of the miners would be endangered by the sudden inrush of water. But both colleries are now being operated as one colliery, and State Mine Inspector E. G. Evans has informed the Schuylkill County court that under the present methods proposed continuance of the pillar is unnecessary.

About 150 representative coal operators of the central Pennsylvania district, meeting at Washington on June 27, recommended that the Fuel Administration close down any mine persisting in the practice of paying miners a bonus or otherwise violating the Washington wage agreement or the regulations of the Fuel Administration.

The action of the operators was taken on the warning of fuel officials that the bonus system threatens to unsettle the labor situation throughout the bituminous field. A resolution was adopted providing for a board of five members, composed of members of the association of bituminous coal operators of the central Pennsylvania field, which will be charged with the task of trying offending operators. Its findings will be subject to appeal to the Fuel Administration.

The membership of the board will be determined by a vote of the operators, and letters have been sent out through the central field asking for suggestions.

## Fairmont, W. Va.

Last week proved to be another good week for the Fairmont district, with cars plentiful for loading. On last Tuesday, with 1754 cars in the Fairmont region, not a mine of the 174 reporting was shut down because of any lack of cars. It is stated by Fairmont operators that the good car supply in the region has been so well maintained that miners who have been following other occupations are returning to work in the mines. Still greater results are expected as the plans of the Fuel Administration, the United Mine Workers, the National Coal Association and the Central West Virginia Association are matured.

Much interest has been manifested in southern West Virginia in the proposal contained in the bill of Senator James Hamilton Lewis, to purchase 125,000 acres of coal land in West Virginia with a view to operating mines for the purpose of supplying the Army and Navy with coal, and to purchase the Virginian Ry. property. Of course, if the railways in the state, it is pointed out, are owned by the Government, the state will lose the taxes now paid by the Virginian Ry., and any other railways which the Government might acquire, and of course the additional tax burden would have to be met by the individual taxpayer. For that reason the purchase of the Virginian does not strike a responsive chord.

## Charleston, W. Va.

That with fair transportation facilities the mines of the state are able to speed up production was demonstrated in the coal fields of Kanawha during the week ending June 22, when the total output was increased over 20,000 tons, the total net tons for the week ending June 15 having been 171,000 tons and for the week ending June 22, 193,885 tons, the increase being made possible simply because more cars were furnished and because the miners put in more time in the mine, as shown by the fact that the total number of hours worked was 7176—an amount much in excess of the time usually put in by miners. The hours lost due to car shortage were reduced from 2190 hours to 709 hours. On the other hand, the hours lost because of labor shortage jumped from 151 to 585 and further loss of time was caused by power shortage. Between June 1 and June 26 33,820 loads were delivered from the Kanawha district, 33,533 empties being received.

Even as mines in the Kanawha district on the C. & O. side of the Kanawha River had a plentiful supply of cars, so mines on the opposite side of the river reached by the K. & M. Ry. also enjoyed an excellent run of cars and were enabled to maintain their output. The supply this week is proving to be unusually good on both the K. & M. and in other parts of the district, averaging between 75 and 95 per cent.

New River mines were turning out coal this week at a rate which indicated an unabated determination to reach the apex of coal production if possible, and although the mines in the New River district have had to contend with power shortage at intervals during the last month, the companies operating in that district have managed to keep production up to a reasonable mark, especially since the Virginian has begun to furnish more cars.

## Duquoin, Ill.

The firm of Dowell & La Font, of Duquoin, Ill., recently negotiated deals for land for the Union Colliery Co. and the E. G. Scott Co. The former coal company is opening up a new plant about five miles south of Duquoin. Other deals were in the interest of the Paradise & Franklin County Coal Co. and a stripping proposition for the Hamilton Coal and Mercantile Co., of Weir, Kan. A deal is just now being closed with the J. R. Coon Co., of Pittsburg, Kan. This company is one of the big stripping concerns of Kansas. Geo. W. Dowell, the senior member, of the firm of Dowell & La Font, is the chairman of the executive committee of the Perry County Council of Defense.

The E. G. Scott Co. proposition is the only stripping in this section of the state. The company controls about 150 acres of land on which there is a 6-ft. seam of coal. The overburden runs from 18 to 35 ft., including a little blue shale in places of an average thickness of 2 feet.

A Bucyrus shovel with a 90-ft. boom and 8 cu.yd. dipper has made the first cut, or box pit, and everything is in readiness for shipping coal. The steam shovel graded a track into the pit of 1.5 per cent. for 2300 ft. Railroad cars will be taken into the stripping and coal will be loaded into them by a small steam shovel. Shipments of coal will be made this month.

## Terre Haute, Ind.

Car shortage is blamed for the decrease in total output for coal in the State of Indiana for the week ended June 22. A car shortage of 13.33 per cent. resulted in a loss of production of 142,520 tons by Indiana coal mines, according to reports to the district representatives of the Federal Fuel Administration. As a consequence there were hoisted during the week 588,211 tons as against 621,500 tons during the previous week. The car shortage was greater than it has been during any of the recent weeks. There was a loss of production of 3.24 per cent. because of labor trouble, and a loss of 5.88 because of mine disability. The greatest car shortage was on the Pennsylvania system, which lacked 30.33 per cent. of a full car supply. The shortage on the Chicago & Eastern Illinois R.R. was 11.11 per cent., and on the Chicago, Terre Haute & Southeastern 8.23 per cent.

## Victoria, B. C.

No. 3 Mine, Crow's Nest Pass Collieries, in which an explosion causing the death of 34 miners occurred on Apr. 5, 1917, has been opened to the face after 14 months of unremitting work. When the inquest took place a few weeks after the accident only 22 bodies had been recovered. All are now accounted for, the majority having been found as the level was cleared and the last four about 10 days ago, when the face was reached. It is thought likely that the inquest will be reopened, the verdict returned last April having been that "death was caused by an explosion, but from the evidence adduced the jury is unable to assign the primary cause." It is claimed by those who have held that the explanation of the disaster would be found when the scene at the most remote working place could be surveyed, that the position in which the last four bodies was discovered to an extent bears out their contention. The evidence, however, seems to be conflicting. The men practically died at their posts. In each case their posture was such as would indicate that they had had some warning and had instinctively tried to shield their heads with their hands. One of their safety lamps was broken, and it is argued that this may have happened prior to the outbreak and be responsible for it. George Wilkinson, Chief Inspector of Mines, has left Victoria to make a careful examination of the mine and of the additional evidence secured.

### PENNSYLVANIA

#### Anthracite

**Inkerman**—Announcement was made on June 29 of the closing down of No. 7 shaft of the Pennsylvania Coal Co. to make repairs and widening of the shaft, which will enable the company to use the standard-size mine car. The shaft is also to be sunk from the present Pittston vein to the Red Ash vein, a distance of 242 ft. While the rockwork in the shaft is progressing extensive inside improvements will also be made. It is estimated the improvements will take several months. The plans include a new steel tower and new first-motion engines. About 250 men employed at No. 7 will be given employment at No. 4 colliery.

**Delano**—The Hollywood colliery of Pardee Bros. & Co., Inc., abandoned 30 years ago as worked out, will be reopened this summer because of the great demand for fuel. A shaft cutting lower veins, deemed inaccessible in the 80s, has been driven, and tunnels are now being run to get out the coal. A complete electric equipment will furnish power. Work for several hundred miners will be furnished and the tonnage of the Pardee colleries will be materially increased.

#### Bituminous

**Butler**—The first coal-stripping operation in this county was put in operation July 1 when the first shipments were made from the pits of the Daylight Coal Mining Co. at Wahlville, near here. It is located on the Knauff farm in Forward township. The new operation is equipped with modern machinery throughout, with special means of preparing and cleaning the coal. The production at the start will be about 500 tons per day and will be shipped over the Buffalo, Rochester & Pittsburgh Ry. The general office of the company is at Indiana, Penn.

**Punxsutawney**—The former operations of John McCleavy & Co. near here, which were sold recently to Thomas A. Furniss, of this city, are in full operation again pending a temporary shutdown while many improvements were made to the mine. The new

mine, which was opened in the upper vein, is producing a high-grade coal. Shipments are made over the Punxsutawney branch of the Pennsylvania Railroad.

**Republic**—A contract has been let by the Thompson-Connellsville Coke Co. for the erection of 20 miners' houses here.

**Connellsville**—The Dawson-Connellsville Fuel Co. of this city will develop a tract of 100 acres of coal land near Fairmont, W. Va. The coal is the Sewickley vein. Frank A. Tarr, S. D. Henry and G. E. Moore are among the prominent Connellsville men interested in the new company.

**Aultman**—The Jefferson and Clearfield Coal and Iron Co. is building two new houses for its mine officials here. They are modern in every respect and are located near "the old farm house" near the company office. When completed they will be occupied by the superintendent and assistant superintendent.

**Heshbon**—A. J. Carnahan, Sr., has sold his coal lands near this place to "Square Deal" Campbell, a famous politician of Indiana County, Mr. Campbell, together with some New England capitalists, has formed a company and a drift has been opened in the "B" Miller vein. A railroad siding will be built up Palmer Creek from the Black Lick branch of the Pennsylvania R. R. to the new operations. The company will be known as the Square Deal Sulphurless Coal and Coke Company.

**Johnstown**—Colleges and historical associations in the bituminous region of Pennsylvania are petitioning for an unusual relic of the early days of mining, found in a pool in an abandoned working where it had lain submerged for many years. It is a coal car, 73 to 75 years old, which looks like a toy when compared to the cars of today. It is now in the possession of M. J. Bracken, general manager of the Inland Coal Co. The wagon is only about 2 ft. long and 18 in. deep, and would hold about five ordinary buckets of coal. It is constructed of wood. The wheels and axles are of wood. Over the wheels are tin "mud guards."

### WEST VIRGINIA

**Charleston**—The Elkland Coal Co. of which C. L. Voglesang is general manager, having completed its plant on the Coal & Coke Ry., is now mining and shipping coal.

**Crown Hill**—A number of new houses will be built by the Crown Hill Coal Co. at Crown Hill for its miners.

**Mahon**—A number of new mining machines are being installed in the mines of the Eagle Byproducts Coal Co. at Mahan, on Paint Creek.

**Thurmond**—Operations will soon be resumed by the Stone Cliff Coal Co. which was forced to shut down its mine at Stone Cliff about two weeks ago when the moniter ran away, killing two men and injuring others. The incline and tipple were damaged, but repairs on them have been nearly completed. During the enforced idleness of the Stone Cliff mine Chesapeake & Ohio engines have been coaling at the Newlyn mine.

The Elkhorn Collieries plan to award a contract in the near future for the construction of 30 miners' houses at the headwaters of Colly Creek. The same company a little later will build 100 miners' houses on Thornton Creek.

**Beckley**—Within a few weeks the Piney Fire Creek Coal Co. expects to be shipping coal from mines it is just opening near here.

**Charleston**—The newly organized Boone County Coal Corporation has purchased the holdings of the Coal Valley Mining Co., on Coal River. The deal was consummated by Col. Quinn Morton, president of the latter company, and W. J. Clothier, of Philadelphia, representing the Boone County Coal Corporation. The sale includes the Sylvia mine in Logan County, which is a drift mine with a 5 ft. seam, employing 70 men. The price paid is said to be $250,000.

**Welch**—The Earlston Coal Co., with principal office and chief works at Kermit, Mingo County, has been organized by D. W. Farquharson and others of McDowell County. The company has a large acreage of coal on the Kentucky side of Tug River which it proposes to develop, but the chief works of the company, including tipple, power house and other buildings, will be on the West Virginia side of the river. The company has been capitalized at $200,000.

The Venture Coal Company, recently incorporated with a capital of $50,000, will develop coal lands in Upshur County. Those chiefly interested in the company are A. J. McDaniel, Oscar Cochran, Henry King, Charles R. Atha and J. D. Victor, of Worthington.

**Bluefield**—At a meeting of the directors of the Bradshaw Coal Co., held here last week, it was decided to enlarge the facilities of the plant located on the Dry Fork line near English and to operate the company's mines on a larger scale, officers being authorized to proceed with improvements necessary to bring the output of the operation up to capacity.

**Clarksburg**—A syndicate of Johnstown (Penn.) coal men has purchased the plant and coal lands of the Trainor Coal Co. of Salem, located near Monongah, the price being about $80,000. J. W. Preston acted as trustee for the syndicate.

**Fairmont**—Fairmont men are interested in a new company—the Dawson Connellsville Fuel Co.—recently incorporated in this state with a capital stock of $120,000 to operate mines on the West Fork River opposite White Day on the Baltimore & Ohio, where the company owns 100 acres of Sewickley coal. The mine will be equipped with electrically driven machinery. A conveyor will also be erected.

### OHIO

**Shawnee**—The Buckeye Coal and Railway Co., of Columbus, started loading July 1 from the old Buckingham mine, located on the Zanesville & Western about midway between Shawnee and Corning. The mine was one of the large operations of the Sunday Creek Coal Co. 23 years ago, when it was abandoned because of much acreage on which a minimum royalty was required. Several weeks ago it was decided to reopen the operation and the water, which has filled the mine for 23 years, was pumped out. It was found that the ties were in excellent shape but the steel rails were mostly rotted. The mine has now been electrically equipped and has been put in first-class condition. The seam is 10 ft. thick, of which 6 ft. is the ordinary No. 7 vein and the remainder a sort of splint which was not mined up to the time of the abandonment of the mine.

### KENTUCKY

**Madisonville**—The Hopkins County Realty Co. has leased to the Sunset Coal Co. the mining rights to the McPherson tract, containing about 125 acres of coal land, and also the coal under two tracts of land at Elk Creek.

It is understood that W. D. Coil, of the Coil Coal Co., has leased from the Hopkins County Realty Co. the No. 9 seam under 750 acres of land, and that Mr. Coil, who is mayor of the city, will install a shaft mine, loading out on the Louisville & Nashville tracks.

**Carrollton**—The Beattyville Coal Co., operating mines at Beattyville, and boats and barges on the Kentucky River, has purchased from Oscar Barrett, of Cincinnati, the property of the Frankfort Elevator Coal Co., on the river-front at Frankfort, and plans to handle coal from the Kentucky River mines through this plant.

**Hazard**—The Blue Diamond Coal Co. recently established a new record for the district when 40 cars of coal were loaded out in one day by its double tipple, which has just been completed at White Oak, on First Creek.

The Montgomery Creek Coal Co., recently capitalized at $100,000, plans installation of plant on Montgomery creek, of Carr's Fork, where a spur track is now being laid. J. W. Reedy and G. W. Smith are the principal backers of the company.

### INDIANA

**Indianapolis**—Production of coal by Indiana mines reached a high figure for the week ended June 15. Reports to the district representative of the Federal Fuel Administration showed that there were hoisted during this period 621,501 tons as against 621,436 during the preceding week. This production was accomplished in spite of a car shortage of 11.16 per cent. as against 7.23 per cent. for the preceding week, the difference in ratio being accomplished through increased efficiency of the mines and through a considerable decrease in the amount of labor trouble which caused a loss of only 1.76 per cent. of time as against 2.93 per cent. for the preceding week. With a 100 per cent. car supply the Indiana production would have been more than 700,000 tons. The greater part of last week's production was mine-run coal, with which the domestic demand is being supplied to a considerable extent. Production of lump coal is being delayed by the sluggishness of the market for screenings.

### ILLINOIS

**Moro**—George Prescott, of Centralia, has organized and incorporated the Moro Coal and Mining Co. to revive the coal-mining industry in the Moro district. Prescott is president of the company and the other officers are Stanley Kolwolkowski, vice president; Thomas M. Kekich, secretary, and Fred F. Reinhardt, treasurer. All except Reinhardt are practical coal men. Reinhardt is a banker at Sandoval, Ill. The company has taken over the George Kabel mine and will install modern equipment, including power machines, steam hoisting engines and an 8-ft. power exhaust fan. About 400 acres of additional coal land adjacent to the shaft has been acquired, and more is being negotiated for. A 6-ft. vein underlies the district, with a percentage of 64 per cent. fixed carbon. Business men will erect homes for the miners and sell them on easy payments. The company will have its headquarters at Alton.

**Galesburg**—The Cripple Creek Mining Co. has opened a new coal mine at Bryant, Ill., and represents that the vein is No. 5, of the Illinois series, which is extensively mined over the coal section of the state and is counted as a good coal. The company has had some tests made which are satisfactory. The coal is clean and burns well. The prospect now is that the plant will be ready to ship coal by July 15. The name given to the new coal is Carbon Lump.

### KANSAS

**Baxter Springs**—The O. B. Ross Mining Co. has been organized to mine coal in the newly discovered coal field near here, and Superintendent O. B. Rose is now putting down a shaft on the J. McSherry farm, which is west of Baxter Springs. The coal, which is 5 ft. thick, is found at a depth of 52 ft. In one borehole coal was struck at a depth of 180 ft., mixed with zinc. Baxter Springs is in the heart of the Oklahoma-Kansas zinc mining field.

## Personals

**Ernest Hutton**, well known in the mining circles of Fairmont, W. Va., has recently become identified with the Jeffrey Manufacturing Co. of Columbus, Ohio, manufacturer of coal-mining machinery equipment, and will represent it in the Fairmont territory.

**A. Niedermeyer**, for many years connected with the Worthington Pump and Machinery Corporation, most recently as works manager of the Snow-Holly Works of that corporation, at Buffalo, N. Y., resigned on May 31 to devote his entire time to enterprises of his own.

**A. B Cole** has been appointed assistant to the manager, Department of Publicity, of the Westinghouse Electric and Manufacturing Co., East Pittsburgh, Penn., to succeed M. C. Turpin, who has accepted a position in the Ordnance Department at Washington, D. C. Mr. Cole will have charge of the editorial work, including the preparation of literature, and supplying information to the press.

## Recent Coal and Coke Patents

**Coal Grate.** J. W. Tatum, Durham, N. C. 1,261,068. Apr. 2, 1918. Filed May 24 1917. Serial No. 170,686.

**Stoker.** W. A. Casler, Louisville, Ky., 1,263,035. Apr. 16, 1918. Filed Mar. 23, 1915. Serial No. 166,454.

**Furnace Structure.** C. D. Mosher, New York, 1,260,789. Mar. 26, 1918. Filed Aug. 30, 1917. Serial No. 188,916.

**Smoke Purifier.** W. L. Boyd, Hayden, Ariz., 1,263,197. Apr. 16, 1918. Filed May 12, 1917. Serial No. 168,182.

**Mine Car Construction.** E. E. Slick, Westmont, Penn., 1,261,308. Apr. 2, 1918. Filed June 9, 1915. Serial No. 32,998.

**Coal Car Cover.** E. M. Shorter, Birmingham, Ala., 1,260,078. Mar. 19, 1918. Filed Jan. 2, 1918. Serial No. 210,016.

**Fuel Saving Device.** S. C. Hays, Franklin, Penn., 1,260,378. Mar. 26, 1918. Filed Sept. 29, 1917. Serial No. 194,001.

**Bottom Dump Car.** O. G. Petersen, Somerset, Ky., 1,263,283. Apr. 16, 1918. Filed July 3, 1916. Serial No. 107,295.

**Grate for Furnaces.** E. W. F. McMillan, Everett, Wash., 1,262,221. Apr. 9, 1918. Filed Jan. 5, 1916. Serial No. 70,545.

**Mine Cage.** W. S. Alsman, assignor to Sullivan Manufacturing Co., Sullivan, Ind., 1,260,290. Mar. 26, 1918. Filed Jan. 19, 1918. Serial No. 212,665.

**Forced Draft Water Grate.** H. F. Morris and R. Shinn, Collingswood, N. J., 1,261,268. Mar. 26, 1918. Filed Sept. 14, 1917. Serial No. 191,361.

**Coal Storage Apparatus.** H. Adams, assignor to Adams Coal Machinery Co., New London, Conn., 1,259,583. Mar. 19, 1918. Filed Oct. 12, 1916. Serial No. 125,165.

**Roller Bearing Mine Car Wheel.** J. L. McDowell, assignor to American Car and Foundry Co., New York, 1,256,149. Feb. 12, 1918. Filed Sept. 5, 1917. Serial No. 189,861.

**Lifting and Screening Shelf for Coal Breakers.** J. L. Hillen, assignor to Pennsylvania Crusher Co., New York, 1,259,983. Mar. 19, 1918. Filed May 1, 1911. Serial No. 624,291.

**Apparatus for Localizing Mine Explosions by Rock Dust Barriers.** J. S. Grasty and W. S. Rodman, University of Virginia, 1,261,922. Apr. 9, 1918. Filed Oct. 27, 1915. Serial No. 58,293.

**Furnace for Burning Pulverized Fuel.** J. E. Muhlfeld, assignor to Locomotive Pulverized Fuel Co., a corporation of Delaware, 1,262,546. Apr. 9, 1918. Filed Dec. 2, 1913. Serial No. 804,192.

**Chain Grate for Furnace Using Mechanical Stokers.** A. L. F. Lefevre, assignor to Societe Anoyme des Hotchkiss & Cie, St. Denis, France, 1,261,564. Apr. 2, 1918. Filed July 8, 1915. Serial No. 38,707.

## Publications Received

**Chart of Properties of Mine Gases.** Compiled by G. A. Burrell. Department of the Interior, Bureau of Mines. Illustrated. Wall Chart, 26 x 36 inches.

**Coal Mining Practice in District I (Longwall).** By S. O. Andros. Bulletin 5 of Illinois Coal Mining Investigations. Illustrated, 42 pp., 6 x 9 inches.

**Soil Survey of Jefferson, Berkeley and Morgan Counties, West Virginia.** By W. J. Latimer, U. S. Department of Agriculture, Bureau of Soils. Illustrated, 74 pp., 6 x 9 inches.

**Monthly Statement of Coal-Mine Fatalities in the United States, March, 1918.** Compiled by Albert H. Fay. Department of the Interior, Bureau of Mines. Unillustrated, 21 pp., 6 x 9 inches.

**Bibliography of Petroleum and Allied Substances, 1915.** By E. H. Burroughs, Bulletin 149. Department of the Interior, Bureau of Mines. Unillustrated, 147 pp., 6 x 9 inches.

**Use of Permissible Explosives in the Coal Mines of Illinois.** By James R. Fleming and John W. Koster. Department of the Interior, Bureau of Mines. Bulletin 137. Illustrated, 103 pp., 6 x 9 inches.

**Recovery of Gasoline from Natural Gas by Compression and Refrigeration.** By W. P. Dykema. Department of the Interior, Bureau of Mines. Bulletin 151, Petroleum Technology 40. Illustrated, 117 pp., 6 x 9 inches

**Mine Safety Devices Developed by United States Bureau of Mines.** By Van H. Manning, Director, United States Bureau of Mines. From the Smithsonian Report for 1916, pages 533-544, with 7 plates. Publication 2473. Illustrated, 6 x 9¾ inches.

**Siliceous Dust in Relation to Pulmonary Disease Among Miners in the Joplin District, Missouri.** By Edwin Higgins, A. J. Lanza, F. B. Laney and George S. Rice. Department of the Interior, Bureau of Mines. Bulletin 132. Illustrated, 108 pp., 6 x 9 inches.

**Carbonization of Illinois Coals in Inclined Gas Retorts.** By F. K. Ovitz, U. S. Bureau of Mines, State of Illinois, Department of Registration and Education; Division of the State Geological Survey. Coöperative Coal Mining Series, Bulletin 20. Unillustrated, 20 pp. 6x9 in.

## Trade Catalogs

**Spare the Coal Pile.** Ingersoll-Rand Co., New York, N. Y. Form 876. Single-page flyer on barometric condensing plants.

**"Little David" Caulking Machine.** Ingersoll-Rand Co., Easton, Penn. Form 901-1. Single-page flyer describing this caulking machine.

**Portable Mine Car Air Compressors.** Ingersoll-Rand Co., New York, N. Y. Form 3015-I. Pp. 4; 6 x 9 in.; illustrated. Describes "ER-I" mine compressors.

**Sullivan "DR-6" Mounted Water Hammer Drill.** Sullivan Machinery Co., Chicago, Ill. Bulletin 70-H. Pp. 16; 6 x 9 in.; illustrated. Describes the Sullivan class "DR-6" hammer drill, with water jet.

**Polyphase Induction Motors.** General Electric Co., Schenectady, N. Y. Bulletin No. 41302A. Pp. 12; 8 x 10½ in.; illustrated. Gives the construction details of company's 15 to 200-hp., Type KT, Form B, induction motor.

**Leyner Shank and Bit Punch—I-R Type.** Ingersoll-Rand Co., New York, N. Y. Form 4039. Pp. 4; 6 x 9 in.; illustrated. Describes Leyner shank and bit punch for punching out holes in bits and shanks of hollow drill steel.

**Form 901.** Ingersoll-Rand Co., New York, N. Y. Four-page flyer showing the complete line of "Little David" pneumatic tools. Tables of sizes and capacities are given and illustrations show all the tools and their applications.

**Blueprint Machinery and Drafting Room Supplies.** C. F. Pease Co., Chicago, Ill. Catalog B. Pp. 272; 6 x 9¾ in.; illustrated. This is an exceptionally well-prepared catalog, bound in hard covers, and excellently illustrated. For easy reference the book has been divided into seven classifications, an index affording easy guidance to one seeking details and prices on drafting-room supplies.

## Industrial News

**Danville, Va.**—The Southern Railway Co. is considering the construction of a new coal chute at its local plant to cost about $30,000.

**Newark, N. J.**—The Edison Storage Battery Co. has established a new sales office in Kansas City, Mo., appointing Benjamin F. Eyer as resident manager.

**Chicago, Ill.**—W. H. Callan, general manager plants, and W. P. Pressinger, general manager sales, of the Chicago Pneumatic Tool Co., have been elected vice presidents of the company.

**Charleston, W. Va.**—An operation will be started at Queen Shoals, W. Va., by the Five Block Coal Co., recently incorporated with a capital of $300,000. A. J. Salzer and others are interested.

**Kenmore, N. Y.**—The Board of Education has taken bids for the construction of a new one-story coal storage building, about 25 x 75 ft. William A. Kidd, 250 Delaware Ave., Buffalo, is architect.

**Coal Center, Penn.**—The Haney Coal Co. has awarded a contract to the Enterprise Contracting Co., Bessemer Building, Pittsburgh, for the construction of a new coal-loading plant at its works to cost about $6000.

**Norton, Mass.**—The Defiance Manufacturing Co., located in the Barrowsville section of Norton, has commenced the construction of a new coal plant at its works. George E. Carver, 53 State St., Boston, is engineer for the company.

**Baxter Springs, Kan.**—The O. B. Ross Mining Co., which is developing a coal tract near here, under the superintendency of O. B. Ross, is in the market for hoisting machinery, belts, steam engines, pumps, boilers, cars, track and lumber.

**Pittsburgh, Penn.**—The Aspromet Company of Pittsburgh (formerly the Asbestos Protected Metal Co.) announces the removal of its Chicago office on July 1, 1918, to the Railway Exchange Building. J. T. O'Neill will continue in charge as district manager.

**Constable Hook, N. J.**—The United States Government, Bureau of Yards and Docks, has awarded a contract to the Guarantee Construction Co., 140 Cedar Street, New York, for the construction of the proposed new local coaling plant. The structure is estimated to cost $130,000.

**Nelsonville, Ohio**—The Hazel Ridge Coal Co., recently incorporated with an authorized capital of $15,000, has taken over the operating mine started by D. M. Poston, who, after getting the mine near Nelsonville in operation, enlisted in the army. George Biermann, of Nelsonville, is the general manager.

**St. Louis, Mo.**—The St. Louis Fuel Committee has refused the following applications for reclassification: Lumaghi Coal Co., Canteen Mine, Collinsville, Standard to Mt. Olive; Southern Coal, Coke and Mining Co., Shiloh mine, Belleville, Standard to Mt. Olive; Northern Coal Co., Gallatin County, Carterville to Duquoin. The reclassifications were asked mainly on the ground of the superior preparation of the output. Other applications are pending.

**Toledo, Ohio**—Lake trade is still active, as is shown by the activity at the dock of the Hocking Valley and Toledo & Ohio Central at this port. During the week ending June 28 the Toledo & Ohio Central loaded 63,735 tons as compared with 71,000 tons the previous week, making a total for the season of 638,735 tons. The Hocking Valley Railway Co., during the same week, loaded 140,450 tons as compared with 144,634 tons the previous week. The total for the season is 1,177,377.

**Louisville, Ky.**—The Gordon & Miller Coal and Coke Co., composed of Ross E. Gordon, J. S. Miller and Boyce Watkins, has recently arranged to take over the improved mine of the Lynndale-Jellico Coal Co., at Lynndale, Ky., near Barbourville, on the main line of the Knoxville division of the Louisville & Nashville. The company has a tipple and trackage into its plant. It is planned to put in additional machinery, a power plant and other equipment to increase the capacity to about 20 cars a day.

**Cincinnati, Ohio**—Reports from Morgantown, W. Va., indicate that the Morgantown & Kingwood R. R., operating 48 miles between Morgantown and Rowlesburg, W. Va., and serving a number of coal mines, may suspend operations on account of inadequate revenues, unless some remedial action is taken soon. That date has been fixed by the management as the date of suspension. However, it is understood that if suspension actually takes place the Government will intervene in order to prevent the coal mines on the road being left without railroad facilities.

**Huntington, W. Va.**—At a recent meeting here of the directors and alternates of the West Virginia Coal Association and secretaries of district associations, resolutions were adopted pledging the coöperation of the association with the United States Fuel Administration, the National Coal Association and the State Council of Defense. The following officers were elected to serve for the ensuing year: J. G. Bradley, chairman, Dundon, W. Va.; G. H. Caperton, vice chairman, Charleston, W. Va.; A. H. Land, treasurer, Logan, W. Va.; W. H. Cunningham, secretary, Huntington, W. Va.

**Charleston, W. Va.**—The capital stock of the Harvey Coal and Coke Co. has been increased under authority of the Secretary of State from $250,000 to $500,000. The president of this company is R. H. Gross, who is also president of the large New River Co. Other companies of which Mr. Gross is also president have increased their capital stock as follows: Stuart Colliery Co., from $500,000 to $1,100,000; Prudence Coal Co., from $100,000 to $300,000; Mabscott Coal and Coke Co., from $135,000 to $250,000. On the other hand. the Loup Creek Colliery Co. has reduced its stock from $2,000,000 to $800,000.

**Columbus, Ohio**—The Charleston Coal Mining Co., incorporated by Columbus men several months ago, has been organized to take over the operating property of the Charleston Domestic Coal Co., located on the edge of Charleston, W. Va., The capitalization is $125,000, a greater part of which is being sold to miners. J. S. McVey, of the Central West Coal Co., is president; F. J. Fried, vice president and treasurer, and H. E. Varga, secretary. Additional machinery will be installed to increase the capacity of the plant. The product is to be sold by the Central West Coal Co., of Columbus.

**Welch, W. Va.**—The Bradshaw Coal Co., which recently purchased all the holdings of the Bradshaw Pocahontas Coal Co. and adjoining land, incorporated under the laws of Virginia, held its first stockholders' meeting at Graham, Va., on Tuesday, June 25. Edward Mann, of Bluefield, was elected president; R. J. Hancock, of Lynchburg, Va., vice president; G. S. Strader, of Bluefield, secretary-treasurer. The following directors were elected: Edward Mann, G. S. Strader and Walter Perkins, of Bluefield; R. J. Hancock and R. C. Scott, of Lynchburg; L. A. Osborn, of Welch, W. Va., and C. L. Biddison, of War Eagle, W. Va. C. L. Biddison will be general manger.

**Chicago, Ill.**—The Allen & Garcia Co., McCormack Building, Chicago, Ill., have been appointed constructing engineers by the Donk Brothers Coal and Coke Co., St. Louis, Mo., in charge of the design and construction of its new No. 4 mine near Edwardsville, Ill. This will be the fourth new mine in the state of Illinois, designed or constructed within the last year, on the basis of skip hoisting and rotary dump at shaft bottom. Another new feature in connection with this property will be the level surface yard, all railroad cars to be handled by shunter locomotive instead of the uncertain gravity system. The power plant will be constructed with a view of supplying electric energy for the operation of mines Nos. 5 and 6, which will be developed after No. 4 is completed.

# MARKET DEPARTMENT

## *Weekly Review*

### *Production of Bituminous Keeping up Well—Where the Coal Is Going—Some Conservation Plans—Stimulating Labor in Soft-Coal Mines—Anthracite Situation Serious—Demand for Coal Active—Lake Shipments*

THOUGH the production of bituminous coal for the week ended June 22 totaled 12,016,000 net tons, a decrease of 610,000 net tons when compared with the output for the week ended June 22, production was at the rate of 643,000,000 net tons a year, or 11,000,000 net tons above the average rate in the record-breaking year 1917.

Even at this rate of production it appears that the mines will be unable to furnish enough coal to meet all needs, which serves to emphasize the fact that the demand for fuel is unprecedented.

Where is all the coal going? It would seem almost needless to answer this question. There's the iron and steel industry, for example. The production of coke is this year larger than ever before, and still the blast furnaces cannot get all the coke they need. Furthermore, it must be remembered that every ton of coal converted into coke has been counted in with the figures of coal production each week. The large tonnage of coking coal consumed by the blast furnaces should therefore be deducted from the amount available for other industries. The steel mills, too, at this time are using a larger proportion of pig iron than in normal years, and a ton of pig iron converted into steel means, in the long run, more coal consumption all along the line than a ton of pig iron used in the iron foundry.

The tinplate mills, which consume more coal per ton of output than any other important branch of the general iron and steel industry, are also running at maximum capacity. Then again, the railroads are consuming more coal than ever before. What is true of the few industries mentioned is equally true of every war plant today.

It can readily be seen, therefore, that the strictest kind of conservation must be practiced in order for the country to pull out on the right side. The Fuel Administration has perfected quite a few plans to cut out the wasting of coal, and not the least ambitious of these is the proposal to save several million tons of coal by effecting economies in power plant consumption. There are 250,000 industrial power plants in the United States. At many of these the amount of coal waste is considerable. Every power plant east of the Mississippi River is to be visited by an inspector and given a rating based on the thoroughness with which the owner carries out the conservation recommendation. The plan is based on the use of the existing equipment without the installation of fuel-saving apparatus. Plants which are prodigal in the use of coal will either have to reform or do without fuel.

Another plan is to save the coal consumed in needless illumination. Failure on the part of nearly every city and town in the country to prevent a waste of electricity has made necessary new action on the part of the Fuel Administration, and before long Dr. Garfield may again invoke his "lightless night" order.

While busily engaged in conservation work, the Fuel Administration has not lost sight of the fact that production must be stimulated to the *n*th power. The mine workers are being exhorted to work full time instead of laying idle whenever the whim seizes them, and the final interment of the assigned car policy assures an equitable supply of empty cars to the mines. If labor in the bituminous coal regions can be induced to work regularly and faithfully, there need be no serious shortage of fuel for all essential industries.

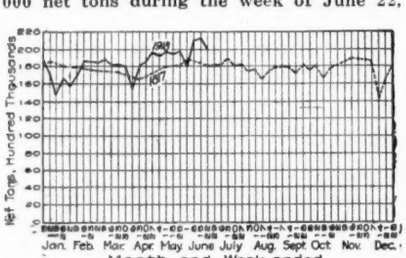
The anthracite mine workers, on the other hand, though not lackadaisical and pleasure-seeking to the same extent as their brethren of the soft-coal regions, are not great enough in number to produce the necessary tonnage of hard coal. Production for the week ended June 22 amounted to 41,170 carloads, which is on a par with the shipments of previous weeks. The continued drafting of employees has placed the hard coal operators in serious straits, and this is forcibly illustrated when it is known that for every man lost to the industry the nation loses 600 tons of coal a year. The magnitude of the loss is further emphasized in the fact that 33,000 mine workers have been withdrawn from the collieries since the war started, which translated into labor power means an annual loss of nearly 20,000,000 anthracite tons of marketable coal.

The market is characterized by a strong demand in nearly every branch. Domestic stocking continues strong, and is taking practically every ton of coal in dealers' yards. With a higher percentage of domestic requirements taken care of by summer storage, it will be possible to concentrate more generally on the industrial supply.

So far shipments to the lakes have not been up to expectations, and a movement of more than 1,000,000 tons is reported from the head of the lakes. Vessel movement is active, and fewer bottoms are going to the upper lake region light. Heavier shipments will be necessary this month to maintain schedules and supply the Northwest before winter sets in.

### COAL PRODUCTION

A sharp decline in production of bituminous coal occurred during week ended June 22. The output of soft coal (including lignite and coal made into coke) is estimated at 12,016,000 net tons, a decrease compared with the week of June 15 of 610,000 net tons, or 5 per cent., and an increase over the same week of 1917 of 701,000 net tons, or slightly over 6 per cent. The average production per working day during the current week is estimated at 2,003,000 net tons as against 2,104,000 net tons during the preceding week and 1,888,000 net tons during the week of June 22, 1917. Shipments from all districts decreased during the week of June 22. Shipments from Ohio and Alabama decreased the most, from the former fields the decrease amounted to 7 per cent. and from the latter fields 12 per cent. Central and western Pennsylvania shipments decreased 4 per cent.




Anthracite shipments during the week of June 22 amounted to 41,170 cars, a decrease of 790 cars or 1.9 per cent.

**Beehive Coke**—A considerable decrease in production of beehive coke in the United States occurred during the week ended June 22. Preliminary estimates place production at 604,000 net tons as against 661,000 net tons during the week of June 15 and the average per working day at 101,000 net tons compared with 110,000 net tons during the preceding week. The principal operators in the Connellsville, Greensburg and Latrobe district of Pennsylvania report production of beehive coke during week ended June 22 at 391,869 net tons, the ovens being operated at 75.5 per cent. of their present capacity, as against 77.2 per cent. during the week preceding. During the week slight improvement occurred in transportation conditions, but such improvement was entirely offset by greater losses due to shortage of yard labor. The same operators produced 143,500 net tons of coal.

**Byproduct Coke**—Operating conditions in the byproduct industry improved further during the week ended June 22, the plants being operated at 89.5 per cent. of their present capacity as against 88.5 per cent. during the week of June 15. A better supply of byproduct coal and improved labor conditions are reported for the country as a whole, while repairs to plants caused slightly greater losses than during the week preceding. Material improvement was reported by operators in Indiana, Kentucky and Tennessee while operators in Alabama, New York and the western states report the only material decreases.

### BUSINESS OPINIONS

**Bradstreet's**—Industrial movements propelled by Government orders are intensely active, readjustments to a war basis implying regulations of one kind or another loom larger than anything else, and in consequence fresh operations in ordinary business lines proceed at a halting gait. With the Government exercising priorities, regulating prices, and taking such goods as are needed, free trading on civilian account is out of the question. This condition is responsible for the universal cry of a shortage of merchandise and the inability of jobbers to fill orders. In such lines as textiles, trade has almost halted pending definite views as to the Government's final action on prices. Potentially fall business is of large proportions, but the general attitude is to defer placing orders for distant delivery until it can be seen which way and how far the price pendulum is likely to swing.

**American Wool and Cotton Reporter**—Many are convinced that when wool is apportioned for civilian production that some definite arrangement will be made in regard to prices of woolen goods. It is believed that it is the settlement of this detail more than the raw wool supply which is holding back regulation. Raw cotton remains high even with the visible supply accumulated because the cotton grower or the holders are firmly convinced that the actual amount obtained from the growing crop will not be especially large, even if present indications point to this fact, and also because it is not the basis of domestic supply, but the basis of world supply on which prices must be regulated.

**Dry Goods Economist**—While the War Industries Board has announced that a large portion of the raw wool stock now in this country, and all of the wool to be produced or imported prior to Jan. 1, 1920, will be required for military uses, the board also declares that the stocks of clothing and cloth on hand will be adequate for essential civilian needs. The board also gives assurance that wool will be equitably distributed to meet both Government and civilian requirements and that prices will be so regulated as to assure a fair and reasonable profit to the industry and at the same time prevent abnormal profits.

**Marshall Field & Co.**—Current wholesale distribution of dry goods for the week is substantially ahead of shipments for the corresponding period a year ago. Road sales for both immediate and future delivery show a good increase over those of the same week in 1917. Customers have been in the market in slightly smaller numbers than last year. Collections are satisfactory, showing an increase over those for the corresponding week a year ago.

# Atlantic Seaboard

## BOSTON

**First quarter of coal year passed and receipts far short of schedule. Coastwise shipping has caught up with the program and railroads have not been offered the tonnage they could have moved, but the volume of coal has not been forthcoming. Arrears since Apr. 1 amount to 2,000,000 net tons bituminous. The 4500 cars weekly quota from central Pennsylvania all-rail yields less than 70 per cent. and a reduction is probable. Apparent fluctuations in program make it extremely difficult to plan distribution and "protect" preferred requirements. Situation bound to develop fast as season advances. State administrators rule on extra compensation for shippers who distribute over wharves not their own. Anthracite program also falls down. Effort made to restrict domestic sizes from manufacturers and other steam users requiring bituminous to be used as a substitute. Query arises, whence will come the bituminous?**

**Bituminous**—The trade is now able to view the results of fuel regulation so far as concerns the volume of coal received in New England. The situation here seems extremely hard for Washington to grasp, and notwithstanding all the representations made and assurances given, this territory at the end of three months since Apr. 1 is falling steadily behind in receipts, and this during the season of most favorable movement and at a time when stocks must of necessity be accumulated. A program for 30,000,000 net tons for the coal year, two-thirds by water and one-third all-rail, April to October movement to be 3,000,000 tons monthly and October to April to be 2,000,000 tons monthly, was arranged early in March, and it was put up to the Shipping Board and the Railroad Administration to move the coal when the necessary volume was produced. It is now perfectly plain, at the end of three months, where the weakness has been in the March program. At the time everybody was agreed that the greatest bar to a full operation of the program would be the shortage of ships. It meant adding to the available steamers in the coastwise coal trade more than 150,000 tons, and notwithstanding all the difficulties this has been done. Steamer tonnage has been steadily increased until on July 1 the total exceeds the mark set in early March. There are now in service 94 ships against the 40 in the trade as late as in the latter part of April.

The railroads also have moved with dispatch all the coal offered them by the connecting lines. It is recognized now that transportation generally has caught up with coal output, and in New England for the three months the showing is impressive. While the average movement via the five New England gateways was 664 in March and 717 in April, the daily receipts in May dropped to 535. Figures for June are not complete, but for 28 days the average for commercial coal was 527. In other words, the present movement all-rail is still far below what it was in April and is even slightly below what it was in January. A month ago it was clearly stated that the New England roads could handle at least 500 coal cars more a day, but this would of course include anthracite both in steam and domestic sizes. Railroad fuel is still being received in less volume than normal, and certainly we are in for serious times if a greater effort is not made soon to build up stocks for the New England carriers.

The net result of sending coal to points other than New England is a shortage of nearly 2,000,000 net tons for the three months since April 1. This is of course on the basis of 3,000,000 tons monthly, as agreed upon in March, and since this serious deficiency is in volume of coal and not in transportation, it is only natural that the trade here should look to the fuel authorities to see to it that deliveries here are on the proportionate basis outlined early in the year. Much prominence has been given to the 4500-car order, so-called, and even yet there is a great lack of understanding of what the order really meant.

The order went into effect June 10, but so far as returns have come in the order has not yet yielded 70 per cent. When it was issued there was a general understanding this accelerated all-rail movement was in no way to conflict with shipments by rail and water via New York and Philadelphia piers, but except for certain routine shipments for railroad fuel and important industries to which coal continues to run the movement in this direction has fallen off to such extent that emergency shipments for account of the New England Fuel Administrator have disappeared entirely. The scheduled movement via tidewater piers from central Pennsylvania was to be 1125 cars weekly. This added to 4500 cars all-rail would amount to 5625, but again there is a flaw in the program, at least in practical operation. It is now strongly intimated that the total movement via both routes is to be something over 4750 cars weekly, and therefore should the quota be reached by either route the supply in the other channel would most seriously fall off.

Anxiety increases week by week, and a large number of consumers are running on hand-to-mouth deliveries. Only in a few scattered instances has there been any opportunity to get reserves, and the railroads are still the most glaring cases where limited stocks are the rule. They, too, have joined the ranks of those determined to use steam sizes of anthracite in power plants, and the volume of buckwheat and silt bids fair to increase rather than diminish. This will be the case probably up to the time when the shippers will not be able to load fast enough to keep up with the demand. Should car supply in the anthracite region be at all affected, the supply of steam sizes would be the first to be curtailed.

On every side the situation is most complicated and difficult for local fuel authorities to supervise. With the program from Washington changing from time to time, it is impossible here to fix upon an adequate plan for proper distribution. No one is yet able to say what is "protection" for a preferred requirement. For the present, the local mark is three weeks.

As a result of the hearing in Boston on June 18 the Massachusetts Fuel Administration fixed upon 23c. (including purchasing commission) as sufficient compensation for shippers who handle bituminous in their own or chartered transportation and distribute over wharves not their own. This was to carry out the provisions of Rule 23, issued from Washington on or about June 1. Some shippers had asked for 5 per cent. of the delivered price, or 40@45c., while others had asked that no increase be granted. The decision is therefore a very moderate concession to those who thought 15c. not enough.

**Anthracite**—Shipments of domestic sizes show no substantial increase over recent weeks. June receipts by water were less than in May, although complete figures are not yet in hand. For 28 days in June the average daily receipts of domestic sizes all-rail were 581 cars. Steam sizes averaged 190 cars daily for the same period. One of the larger shippers advanced prices 25c. on these sizes on June 12.

A determined effort is being made to shut off domestic sizes from manufacturers for steam use. The amount of this tonnage, especially that which has replaced coke, is surprising; but if all this is to be replaced in turn by bituminous, the query may well be raised. Whence will come the bituminous?

## NEW YORK

**Dealers are gloomy over the outlook and hope that receipts will increase shortly. Division of fuel district in New York State opposed. Committee of Bronx taxpayers to see Dr. Garfield. Demand for the steam coals continues heavy. The bituminous situation serious. Free coals are scarce and large consumers become anxious.**

**Anthracite**—The optimism prevailing in Fuel Administration circles as to the outlook is not so much in evidence among the trade. The shortage seems to be as heretofore, and the dumpings at the local piers for the week indicate one more car emptied than was dumped during the previous week. Receipts are not anything like the trade would have them, and complaints are numerous.

The reports emanating from Washington that it is contemplated to appoint a Fuel Administrator for the upper part of the state does not meet with the approval of the trade, and there is said to be much opposition to a divided fuel district in this state. Coal men, however, are solid in the belief that a State Fuel Administrator should be appointed at once, otherwise they are of the opinion this state will face a serious fuel situation next winter.

The situation in Bronx County is so desperate that a committee of taxpayers will shortly visit Dr. Garfield in Washington and present to him the claims of that county. It is the opinion of these taxpayers that the county is being discriminated against and that preference is being shown to New England in the way of shipments. It is claimed that during the year ended Mar. 31, 1918, there were consumed in the county 870,977 tons of coal, while the allotment made by the Fuel Administration for the current year is but 850,975 tons, although the dealers have applied for 1,344,000 tons. It is proposed to place these and other facts before Dr. Garfield and show him that unless more coal is sent to the dealers there will be many heatless houses in the Bronx next winter.

Unless the order to the Anthracite Committee sending an increased tonnage into New England is renewed, receipts here ought to show a big increase his month.

For the week ended July 1 the dumpings of anthracite recorded at the tidewater docks in this harbor were 7426 cars, or one car more than the previous week. For the month of June there were dumped 30,713 cars. Shipments of anthracite as reported by Government statistics for the week of June 22 showed a falling off of 790 cars as compared with the previous week, 41,170 cars having been sent to market as against 41,960 cars for the week ended June 15.

Operators are anxious about the labor situation at the mines and predict a still greater shortage of coal unless the War Department acts quickly in exempting miners from the draft law provisions.

The activity in steam coals continues, much of the demand being due to the efforts to use barley and culm in place of bituminous or in mixing these sizes with it, owing to its scarcity. Buckwheat No. 1 is nearly as scarce as the domestic coals. Rice and barley are easily moved, some of the railroads storing quantities of the latter size for next winter.

The demand for all sizes among the line trade is heavy. Dealers in some localities say they have delivered as much coal as they usually have placed in bins by Aug. 1.

Current quotations, per gross ton, f. o. b. tidewater at the lower ports, follow:

| | Circular | Individual | | Circular | Individual |
|---|---|---|---|---|---|
| Broken | $6.50 | $7.25 | Pea | $4.90 | $5.65 |
| Egg | 6.10 | 6.85 | Buck | 4.85 | 5 60 |
| Stove | 6.35 | 7.10 | Rice | 4.35 | 4.80 |
| Chestnut | 6.45 | 7.20 | Barley | 3.85 | 4.00 |

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates. Prices for buckwheat, rice and barley are not fixed by the Government.

**Bituminous**—There has been no letup in the demand, and dealers see no increase in receipts. There is still much dissatisfaction over the preference order for New England, it being felt in local circles that New York is the loser.

Definite announcement by the railroads fix the freight rates on coal coming to South Amboy from central Pennsylvania and to St. George from certain districts along the Baltimore & Ohio at $2.15 per gross ton, to which the war freight tax of 3 per cent. is to be added, an increase of 50c. per ton. The rate to the upper ports is 5c. per ton higher.

Stocks here show no increase. Free coals are hard to find, while regular customers are getting just about enough to supply their immediate needs. There were 7228 cars of bituminous dumped at the local tidewater docks in the seven days ended July 1, as against 7239 cars the previous week. For the month ended June 30 there were 30,861 cars of bituminous dumped. During the week ended June 22 there were 212,886 cars of bituminous shipped to market, as compared with 222,892 cars shipped the previous week, an increase of 10,006 cars.

Large consumers are becoming alarmed over the situation and are not optimistic of the future. The railroads are preparing to store large quantities for winter, but are not able to obtain anything like the tonnage they would like.

After considerable work on the part of a committee of The Wholesale Coal Trade Association of New York, jobbers are to be allowed a margin not to exceed 35c. per ton on coal physically handled by them. This margin is allowed them as a result of an order issued by Ellery B. Gordon, assistant to state fuel administrator. This margin is to be added to the mine price of the coal plus freight rate to tidewater plus war tax on freight plus demurrage plus actual harbor boat charges.

Current quotations, based on Government prices at the mines, net ton, f. o. b. tidewater, at the lower ports, are as follows:

| | Mine Gross | F. o. b. N. Y. Gross |
|---|---|---|
| Central Pennsylvania: | | |
| Mine-run, prepared or slack | $3.30 | $5.45 |
| Upper Potomac, Cumberland, and Piedmont Fields: | | |
| Run-of-mine | 3.08 | 5.23 |
| Prepared | 3.36 | 5.51 |
| Slack | 2.80 | 4.95 |

Quotations at the upper ports are 5c. higher.

## PHILADELPHIA

**Anthracite situation grows serious. Receipts shorter than for two months. Quotas for large buildings cut. Buckwheat to be conserved. Schools to get full tonnage. Rent raisers taken in hand by fuel com-**

**mittee. Strong hope for improvement in July. Quotas increased 18%. Questions raised by freight increase. New labor problem. Bituminous car supply about 50%. Fair shipments locally. Improved tide movement. Brokers do fair business.**

**Anthracite**—The past week has been one of great publicity to the retail coal trade. The newspapers have printed interviews calling attention to this city's need for anthracite. In an effort to offset another coal shortage next winter, the fuel authorities began reducing the supply to various large buildings. For over a month a large number of inspectors under instructions from the fuel conservation chairman has been visiting apartment houses, stores and manufacturing plants, checking up statements made in answer to a questionnaire concerning their fuel needs, together with the equipment for economical combustion. It is claimed that many faulty statements have been received, and it is probably due to this that drastic cuts will be made. The fuel administration seems determined to conserve fuel for the homes in every possible way and will see to it that only minimum supplies are furnished to large buildings. While it is stated that no war industry has yet been curtailed, it is the intention during the coming winter to care for the homes first, then the war plants and then the non-war concerns last.

In this connection it can be said that the list of plants refused permission to purchase buckwheat grows in number. As a consequence those plants which have been granted exemption have been enabled to increase their storage piles quite considerably. Among this latter class are a number of concerns who are not strictly on war work, and it would be no surprise at all when winter comes to see such stocks commandeered for domestic use.

The number of retail firms refusing to book additional orders until those on hand have been materially reduced is growing almost daily. It was reported this week that the largest concern in the city had now taken this stand. In the meantime those with orders on the books continue to urge the delivery of the coal.

With the month of June now closed it must be said that the coal receipts for the city were most discouraging and are understood to be much below those of April and May. Just how far short of the actual needs of 233,000 tons per month, which is the basis for the yearly estimate as announced by Chairman Lewis, has not yet been ascertained, but the shortage has been estimated by various interests at 75,000 to 80,000 tons; and using the latter figure, this would make the June receipts of domestic coal 153,000 tons, which we feel is about accurate. However, as we start into July at least one of the big operating companies claims it expects to give all its local trade a goodly increase. So far as we can learn this is predicated on the fact that it will this month make shipments with all quotas increased 18 per cent as announced by the fuel authorities some time since. Action on this increase has been postponed from time to time with the hopes that this city would be granted a heavier increase than 18 per cent., but it is stated for the present this will not be done.

Referring to the new freight rates, it is interesting to note that there are now only two rates, that of $1.90 for domestic coal and the other $1.70 for pea and smaller. This latter classification is an innovation, as before the recent 45c. advance pea was $1.25 and the steam sizes $1.20, and for many years there was such a variation. The above rates, of course, are for the most direct routes to the city, the differentials via the other roads still making those rates higher, as usual.

The labor situation among the retailers does not improve, and is really almost as serious a factor as is the slowly diminishing number at the mines. It is next to impossible to get men to make retail deliveries, and when they do work they surround the job with conditions that make their retention almost worthless. In order to help this situation a ruling has now been made that retail dealers will not be required after July 1 to make deliveries in the customer's cellars where the coal cannot be chuted from the wagons. Heretofore an extra charge has been made for carrying the coal, but it has been so difficult to induce men to do this that the fuel authorities have ruled that in such cases the customer must either do this work himself or provide the necessary labor. Of course, all dealers do not expect to apply this rule, except where it is absolutely necessary.

The demand for all steam grades continues unabated, with the usual exception that culm is quite free. Locally the demand for this does not increase, but in the eastern market there has been no diminution, although some whispers of complaint are being heard that the cars used for this coal might be used to better advantage on other sizes.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

| | Line | Tide | | Line | Tide |
|---|---|---|---|---|---|
| Broken | $4.90 | $6.25 | Buckwheat | $3.40 | $4.45 |
| Egg | 4.50 | 5.85 | Rice | 2.90 | 3.80 |
| Stove | 4.75 | 6.10 | Boiler | 2.70 | 3.70 |
| Nut | 4.85 | 6.20 | Barley | 2.40 | 3.30 |
| Pea | 3.45 | 4.70 | Culm | 1.25 | 2.15 |

**Bituminous**—In the soft-coal trade car supply still dominates the situation, as there has been little or no improvement recently. It seems that the golden days of a few weeks past when an almost 100 per cent supply, based on present production, was to be had, is now but history. There continues to be some chafing over the 900-cars-per-day order to New England, and we really doubt if that many cars are now going forward. The local consumers are receiving a fair tonnage and most of the vital plants continue to be able to store good supplies. This is particularly true of public utilities, where the visible stocks are getting close to normal. It has now been some time since it has been necessary for the fuel administration to divert any tonnage. Of course, this is due to the better production, but much credit also belongs to the bituminous distribution committee of operators who are now handling this work for the administration. Tide shipments are increasing now that the submarine flurry seems to have subsided. In the brokerage trade many of the houses are receiving fair supplies by following the plan of permanently locating representatives in the region and buying stray cars, particularly from wagon-mine operators.

### BALTIMORE

**Rather remarkable lack of stimulation noted in buying bituminous for future when supplies are fairly easy. More bad coal received. New retail anthracite prices out following freight-rate jump.**

**Bituminous**—Dealers in soft coal here utterly fail to offer any adequate explanation of the lack of active seeking for coal supplies for the future on the part of many consumers. At present there is a fair supply of bituminous here as a result of diversions to the account of the fuel administrator of Maryland, augmenting the regular shipments, and while it is being absorbed there is none of the competitive rush for coal that might be expected after the shortage lessons of last winter and the idea being steadily pushed from Washington that conditions the coming winter are to be even worse.

A number of rejections from Tidewater Pool No. 18 were noted specially the past week. Some of the coal rejected is classed as "very poor." Little complaint, if any, is heard over the advance in freight rates of 45c. on line shipments of soft coal here or on coal for piers and delivery inside the Virginia Capes. Most people take jumps in prices and rates as a matter of course these days. There is a little less understanding of the need of making the outside the Capes increase 50c., however.

**Anthracite**—Facing necessity of adjustment of a freight-rate increase on prepared sizes of around 60 and 65c. since last April, the Baltimore retail coal men, after several conferences with the fuel administrative force in this city have issued a new retail sale schedule. In this schedule the coal men absorb 15c. of advance on prepared sizes and the public 45c. of the advance of from $2 to the new rate of $2.60. The freight-rate advance of 50c. on pea coal, or from $1.60 to $2.10, is absorbed by the coal trade, as that fuel, known as poor man's coal, remains at the old April schedule price. There are no changes in peck and bushel sale rates either, and this is the more noteworthy as there has been no advance in these small sale lots since last winter. The coal men here are complaining more about lack of ability to get coal than anything else. They admit that many consumers who placed orders last April and May, and whose coal has not been delivered, will be disgruntled over the fact that they will have to pay the new delivery price. The new retail anthracite schedule for Baltimore is as follows:

| 2240 Lb. to the Ton | Ton | ½ Ton |
|---|---|---|
| Hard White Ash: | | |
| No. 1 (Broken) | $10.75 | $5.55 |
| No. 2 (Egg) | 10.45 | 5.40 |
| No. 3 (stove) | 10.70 | 5.50 |
| No. 4 (chestnut) | 10.80 | 5.55 |
| Pea coal | 8.95 | 4.65 |
| Buckwheat | 8.60 | 4.45 |
| Lykens Valley: | | |
| No. 2 (egg) | 11.15 | 5.75 |
| No. 3 (stove) | 11.55 | 5.95 |

Prices for half tons are net.
A discount of 25c. per ton for cash.
Bagging, trimming and all labor in putting away coal to be charged at actual cost.

## Lake Markets

### PITTSBURGH

**Heavy production shows magnitude of consumption. Steel industry's requirements heavy. Market narrow.**

The record production of bituminous coal in the last three weeks and the fact that coal has not become plentiful, emphasizes the statement that coal requirements are altogether unprecedented.

Lake shipments are not causing any particular trouble, the movement proceeding rather smoothly and with indications that the amount permitted for the lake season, 4,000,000 tons for Canada and 24,000,000 tons for domestic ports, or 28,000,000 tons in all, will be provided without any great difficulty.

There is some stocking of coal, and perhaps a trifle more than a month ago, but all the testimony is that the stocking is proceeding much too slowly to suggest that the prospective difficulties of next winter are being safeguarded against. The by-product coke plants in particular frequently experience difficulty in getting enough coal for current consumption and are accumulating but little of the large reserves they would like to have for winter. The market is narrow, with open transactions representing but a small volume; and most of the transactions are in the form of allocations. The market remains quotable at the set limits: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district, with 15c. brokerage allowed to regular brokers.

### BUFFALO

**Still predicting big winter shortage. Not much change in trade, except that anthracite is hardly so plenty. Some jobbers are doing well. Lake shipments fairly good.**

**Bituminous**—The situation does not change much except that all predictions agree in looking for a shortage next winter quite as large as last, no matter what else happens. Whether the one report is an echo of another is hard to say, but the effect is seen in the increased effort to stock up. If there is a consumer next fall with empty storage capacity he will be reckoned either foolish or unfortunate. As it is now, all but the more isolated districts are able to get more coal than they need, and the rule is that they are making the most of it.

Jobbers as a rule do not find their business improving, but at the same time the more active and reliable are selling a liberal amount of coal. They do not claim to know how they get hold of the coal, but they either manage to stand pretty close to certain operators or they have a large amount of buying territory on their lists. It will not answer to stand still these days and let business come to you, for that will never happen.

Territory dependent on Buffalo for most of its coal is now pretty well taken care of. Canada, as a rule, has enough and New York state is fairly well taken care of; but the gateways to New England are pronounced too small for its needs. North of tidewater they are Poughkeepsie Bridge, Albany and Mechanicville.

The latest fixed prices are not well worked out yet, but at least certain leading jobbers are billing at $4.75 for thin-vein Allegheny Valley, $4.45 for Pittsburgh lump, $4.20 for Pittsburgh mine-run and $3.95 for Pittsburgh slack, all per net ton, f. o. b. Buffalo.

**Anthracite**—The supply locally continues to run down. Shippers as a rule agree that there is nothing out of the ordinary about that, for they are sending all of their surplus up the lakes, and they will continue to do so all summer if a supply is laid down at upper lake ports sufficient to carry that territory through.

If Buffalo is suffering at all, it is because more anthracite is going east and to the army camps than we can well spare. When the lakes close in early December the amount going into that trade, if diverted entirely to this section, would meet all needs, but it is likely that New England and perhaps some other eastern districts would claim a part of it. The county administrator is warned by the state administrator that too much anthracite is going for steam making.

The amount of coal loaded for lake shipment for the week was below the recent average, being 98,750 net tons, of which 58,500 tons were loaded for Duluth and Superior, 20,200 tons for Chicago, 8000 tons for Sheboygan, 7600 tons for Green Bay, 3000 tons for Houghton and 1450 tons for Portage.

Freight rates remain at 48c. for Duluth, 50c. for Sheboygan, Green Bay, 60@65c. for Chicago and 75c. for the Portage lake ports of Houghton and Portage.

### CLEVELAND

**Ohio mines close, making further cuts in receipts. Local coal interests predict winter famine, being unable to place contracts. Fuel administration seeks old railroad lumber to aid domestic fuel supply. Lack of cars cuts week's supply 39 per cent.**

**Bituminous**—Turn of the month has not brought any improvement in the coal situation in this market. Car shortage is given as the basis for the absence of normal supply of coal at this time, and although steps toward placing the situation before the Federal Railroad Administration are being considered, it is admitted there is no suggestion to offer, so far, to remedy this deficiency. The extreme car shortage has caused some mines in Ohio to close during the last week or so, and hundreds of miners are actually in danger of starving, the local trade has been informed. This combination presages a coal famine even worse than that of last winter. Already the production, as it will affect Cleveland, is 75 per cent. of normal, because where mines, even though slowing down, still are operating, they have much less labor than in times before the war. The local situation is especially critical, because, unlike other centers, there is practically no contracting ahead. To such concerns here, which have not contracts, mines are refusing to supply coal. With the priority orders now in effect, those consuming firms most essential to Government service are now getting the big supply of bituminous coal. The steel mills here are not able to put out as much product as they might if both car and labor situations were more normal. The latest report from the local offices of the Pittsburgh Vein Operators Association, of which D. F. Hurd is secretary, shows a shortage of coal of 39 per cent., or approximately 100,000 tons, due to the insufficient car supply, which is 2341 cars. More than 17,000 additional tons has been lost due to mine disability, labor shortage and the like.

**Anthracite**—Because most of the anthracite coal passing through Cleveland is being shipped up the lakes, and practically none consigned to Cleveland, receipts here are almost nil; and there is no indication the situation will be improved this month.

**Lake Trade**—Manning of 25 vessels for lake coal trade was completed this week, but this is not expected to help much unless receipts are increased. The lake schedule out of this port called for 4,000,000 tons, but only 3,500,000 were shipped, latest figures will show. Many boats have left with light cargoes, for although there were fifty vessels, there was not enough coal to distribute among them. Shipments for the last week were something more than 800,000 tons, but the normal movement for this period should be 1,000,000 tons each week. The amount fixed for July is 4,500,000 tons. It is admitted the lake trade has loosened up considerably in the last few days, so that the Fuel Administration's plan to get coal into the Northwest is working out well.

### DETROIT

**Inadequacy of supply continues to handicap early buying. Lake shipments make little gain.**

**Bituminous**—Coal is not yet coming into Detroit as freely as jobbers and wholesalers say is necessary to assure a sufficient supply for the city's needs later in the year. The movement in June was disappointing to dealers who had hoped the month would give a strong impetus to the establishing of reserves not only among users of steam coal but in the yards of retail dealers as well.

Shipments received during the month, according to estimates of some of the jobbers, represent an aggregate little if any greater than the amount of supply necessary to fill current requirements. Complaint is heard that the supply of domestic stock is conspicuously deficient in quantity, while mine-run constitutes the larger bulk of the receipts, other sizes, including slack, reaching the city only in moderate amount.

Restoration of amicable relations has taken place between the Michigan fuel administrator, W. K. Prudden, and Detroit business interests represented by the Detroit Board of Commerce.

**Anthracite**—Detroit is not yet receiving anthracite in any substantial amount. Much of the time during June receipts were under 40 cars a day. Household consumers are unable to get orders filled but are unwilling to stock up with bituminous.

**Lake Trade**—Movement of coal over the lake routes in June did not equal expectations. Shipments were augmented for a few days early last week, but before the end of the week slumped off again with a light movement from the Pittsburgh district. Heavier shipments will be necessary this month to maintain schedules and supply the Northwest before winter sets in.

### COLUMBUS

**Strong demand characterizes every branch of the coke trade in Ohio. Mining operations in certain districts have been improved.**

The coal trade in Ohio during the past week has been active in every way. Demand for steam, domestic and lake tonnage is still strong, and there is still a scarcity of available stocks. The lake trade is being rushed as rapidly as possible and steam users are increasing their storage. On the whole the tone of the market has been active in every way, and prospects are for a continuation of the strong demand from every locality.

The domestic trade is still one of the important departments of the industry. Dealers are clamoring for stocks and have placed orders both for immediate and deferred delivery. Retail stocks are quite light and most of the dealers are operating from hand to mouth. Retail prices will be changed to take in the new freight rates and also the advances in most Ohio districts which were announced effective June 29. Dealers are busy making deliveries, as users are now anxious to secure their stocks for the coming winter. Pocahontas is quite scarce and only small consignments are arriving in the local trade. Some West Virginia splint is available. Pomeroy Bend and the Hocking Valley are supplying the largest tonnage.

Steam demand is also good and the larger consumers especially are making frantic efforts to increase their surplus stocks. Many of the users have all available storage space occupied. The smaller users are following the example of the larger consumers and are also stocking up to guard against an emergency. Fuel regulation is holding down orders in certain places. Railroads are taking a goodly amount for the operation of trains.

Lake trade is strong, and a priority order is now looked for in order to stimulate lake movement. So far the lake trade has not been up to expectations, and a shortage of more than 1,000,000 tons is reported from the head of the lakes. Vessel movement is active and fewer bottoms are going to the upper lake region light.

Lake prices are firm at the new levels announced by the Federal Fuel Administration several weeks ago.

### CINCINNATI

**Record-breaking deliveries are under way, facilitated by improved car supply and good weather. Labor conditions present the only probability of trouble at present.**

Loadings at West Virginia mines during the past week broke all records, indicating the decided improvement which has taken place in the matter of car supply and the satisfactory condition of the supply of labor for the time being. Some deliveries of new open coal cars are reported to have been made, rather unexpectedly early, considering the fact that the orders for the equipment were placed only a short time ago; and as it is obvious that deliveries will increase as time goes on, it is evident that the shortage of rolling stock, which contributed so largely to the distressing conditions of last winter, will be largely remedied before cold weather again sets in. The movement of coal to the lakes, under the system of distribution now in force under the orders of the Fuel Administration, is very heavy and bids fair to care for all of the requirements of the Northwest without difficulty. In fact, if the threatened shortage of labor does not develop acutely, the effective coöperation of the railroad and fuel branches of the national administration promises to take care of the Nation's extraordinary fuel requirements in an astonishingly efficient manner. With a higher percentage of domestic requirements than ever before taken care of by summer storage, it will be possible to concentrate more generally on the industrial supply. The trade is becoming more and more optimistic over prospects in this respect.

### LOUISVILLE

**The domestic stocking demand continues strong, and is taking care of practically all of the coal received from both the eastern and western Kentucky fields at this time. Steam demand about normal, with production generally light.**

Unless coal production increases in both the east and west Kentucky fields, even Louisville, located between two considerable fields, will have trouble in securing coal supplies this winter. At the present time no surplus stocks are being secured, while increased consumption is shown on every hand. The new Government powder plant at Nashville, Tenn., is expected to take a large percentage of the production of that district and general plants are operating on Government contracts and must be supplied.

During the past week it was announced that the Government would erect a large powder plant at Louisville in addition to the one at Nashville, and it was further announced that a new artillery cantonment with a capacity of 30,000 men would be erected at West Point, Ky. These two new developments alone will take a considerable volume of coal, and increase the necessary tonnage, whereas production in both the east and west Kentucky fields has been steadily decreasing due to the shortage of labor.

### BIRMINGHAM

**Production being speeded up to some extent. Supply to meet domestic and steam requirements still short. Market very active for all grades.**

Alabama mines made some progress in the prime essential of increased production during the past week, according to information gathered from the producers and distributing agencies, and the opinion is held that continued improvement will be shown from now on.

There is still a distinct shortage in receipts of domestic coal by local dealers to care for the orders now in hand, practically no stocking having been accomplished in respect to the higher grades of coal. The Montevalle Mining Co., the largest producer of strictly domestic fuel and the only company which has contracted its output to any extent, is now installing six longwall conveyors in its mines at Aldridge, which is expected to materially increase the output. Much of this coal is being sought in North Georgia points, which formerly depended on Tennessee and Kentucky fields for the better grades of fuel.

The fuel situation with the railroads is somewhat easier than before for some weeks, and some accumulations are reported in storage bins, which will probably enable a reduction in priority requirements and provide a more liberal supply for industrial plants. The Southern Ry.'s advertised requirements for some 1,800,000 tons for the year ending June 30, 1919, are reported to have been about two-thirds provided for in tentative agreements. Other contracts for railroad fuel are being made as the old ones expire.

The sharp increase in coal rates from the fields supplying the local market are being commented upon generally and some adjustments are expected.

## Coke

### CONNELLSVILLE

**Market quiet. More byproduct coke in prospect. Connellsville production steady.**

There has been no further contracting for furnace coke, following the few contracts hitherto reported. The great majority of the furnace-coke contracts are for the whole year, requiring no mid-year negotiations. In the case of foundry coke quite a number of contracts expired June 30, and many of these have not been renewed, so that there will be more prompt business done than formerly. Foundry coke is in only moderate supply, but on the whole it is easier to buy foundry coke than furnace, as operations are proceeding in such a way that a rather high proportion of 72-hour coke is made; and the operators prefer to make foundry coke, as there is no difficulty in securing the full $7 price, as compared with $6 for furnace.

There is considerable speculation as to what will occur in beehive-coke production in the Connellsville region as the new byproduct ovens in the Central West get into operation, using Connellsville coal quite largely, although not exclusively by any means. That there will be some reduction in Connellsville coke output seems probable. Thus far, however, there has been no material change, although the American Steel and Wire Co.'s new plant of 180 ovens at Cleveland is now in nearly full operation, having made its first coke early in May, while last week the first battery, 128 ovens, of the Carnegie Steel Co.'s Clairton plant was put in operation. Four more batteries will follow in the next two or three months, while six more will come some time next year. At the first of this year the existing byproduct coking capacity was approximately 500,000 tons a week, according to the individual works rating, but experience has shown that from a combination of causes the actual production runs 88 to 90 per cent. of capacity, this having been the testimony of the Geological Survey's weekly reports for more than two months past. Capacity by some time in September should have risen to about 640,000 tons weekly, promising an actual output of about 575,000 tons a week.

Furnaces have been endeavoring to accumulate some surpluses of coke to carry them over the curtailment in coke movement that invariably occurs at Independence Day, and have been fairly successful. The market remains quotable at $6 for furnace, $7 for foundry, 72-hour selected, and $7.30 for crushed, over 1 in., per net ton at ovens.

The "Courier" reports production in the Connellsville and Lower Connellsville region in the week ended June 22 at 344,950 tons, an increase of 1980 tons. For about 10 weeks past production has averaged 341,000 tons a week.

**Buffalo**—The trade drags a good deal, for though it is not so difficult to buy coke it is a hard matter to get it delivered. The late advance of freights from the Connellsville district from $2 to $2.60 would not be a hindrance if the cars could be had, for any rate would fail in that respect. The furnaces are kept going somehow. What they pay for coke is not known to the jobbing trade, for it gets none of that business; but the regulation of $7 and $6 for the best grades is still in force, to which must be added the $2.60 freight and no middleman's profit. Considerable breeze coke is selling for steam making at about $2.75 net, oven price. Iron ore receipts are large, being 308,813 gross tons for the week. Cars for shipping out ore are so scarce that it piles up badly at the docks.

# Middle Western

## GENERAL REVIEW

**Demand in excess of supply. Will be shortage in anthracite. Production hampered by car shortage.**

The demand at the present time for both steam and domestic coals from the producing districts of Indiana and Illinois is greatly in excess of the supply. Screenings and mine-run coal from the Springfield and Standard districts of Illinois are selling strong. This is a decided change from a week back, when these coals were to be had at a substantial decrease from the Government price. This condition is brought about as much as anything by the recent ruling of the Fuel Administration, which allows both Illinois and Indiana screenings to go into the southern part of Michigan. In addition, a number of factories in the Chicago district have become alarmed over their supply and have endeavored to place orders for extra coal so that they will go into the winter months with a supply on hand sufficient to run them from one to two months at least. The difficulty they are encountering is that they can find but few operators to book their orders. The producers who have their regular business are only able to give them enough coal to keep them going from week to week. High-grade screenings and steam coals from the southern part of the state are hard to get. This is equally true of the Springfield and Standard districts. It is rumored that one of the large western railroads having mines in the central part of Illinois is about to close its mines for a short period and purchase its coal on the open market. This rumor has given a decidedly bullish tinge to a market already strong.

The retail dealer is now fairly awake to the problems to be faced next winter, and in a number of cases dealers have hired vacant lots or available property near them and on this property are piling up mine-run, screenings and 2-in. lump. They have come to the conclusion not only will there be a shortage of anthracite, but in addition there will not be enough high-grade southern Illinois domestic coal to go around. The demand for domestic coals is keeping up as strong as ever. Retail dealers are trying to place orders with their various sources of supply, and in case orders have been placed they are trying to have these orders increased. The buying public is wakening up to the situation and trying to get under cover.

The tonnage in the states of Indiana and Illinois will not be up to its maximum for this period, as production has been hampered by car shortage and lack of miners to produce the coal. The car situation is just about the same, but the labor situation is getting worse from week to week.

## CHICAGO

**A slight fall in the volume of retail orders was noticeable toward the end of the week.**

The disposition on the part of domestic coal users to order their winter supply now continues, but with a marked decrease the last three days, to be attributed, perhaps, to warmer weather. Retailers are loaded up with orders for some time to come, so that this condition gives no cause for alarm.

There is practically no anthracite in the Chicago market, certainly none which is not covered by long standing orders.

The new ruling of the Railroad Administration to the effect that freight bills must be met on a cash basis has caused dealers with limited capital to insist on cash on delivery. This, also, has probably been one cause of the let-up in orders from domestic consumers.

All grades of coal continue to be taken by large consumers, as rapidly as they are received, with the exception of certain grades of screenings, but stocks of those are not accumulating to any great extent.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

| | Williamson and Franklin | Saline and Harrisburg | Fulton and Peoria | Springfield | Carterville | Grundy, La-Salle, Bureau and Will. |
|---|---|---|---|---|---|---|
| Steam lump | $2.55@2.70 | $2.55@2.70 | $2.95@3.10 | $2.55@2.70 | $2.55@2.70 | $3.25@3.40 |
| Domestic lump | 2.55@2.70 | 2.55@2.70 | 2.95@3.10 | 2.55@2.70 | 2.55@2.70 | 3.25@3.40 |
| Egg or furnace | 2.55@2.70 | 2.55@2.70 | 2.95@3.10 | 2.55@2.70 | 2.55@2.70 | 3.25@3.40 |
| Small egg or nut | 2.55@2.70 | 2.55@2.70 | 2.95@3.10 | 2.55@2.70 | 2.55@2.70 | 3.25@3.40 |
| Stove | 2.55@2.70 | 2.55@2.70 | 2.95@3.10 | 2.55@2.70 | 2.55@2.70 | 3.25@3.40 |
| Chestnut | 2.55@2.70 | 2.55@2.70 | 2.95@3.10 | 2.55@2.70 | 2.55@2.70 | 3.25@3.40 |
| Pea | 2.55@2.70 | 2.55@2.70 | 2.95@3.10 | 2.55@2.70 | 2.55@2.70 | 3.25@3.40 |
| Washed egg | 2.75@2.90 | ..... | ..... | 2.75@2.90 | 2.75@2.90 | 3.45@3.60 |
| Washed stove | 2.75@2.90 | ..... | ..... | 2.75@2.90 | 2.75@2.90 | 3.45@3.60 |
| Washed nut | 2.75@2.90 | ..... | ..... | 2.75@2.90 | 2.75@2.90 | 3.45@3.60 |
| Mine-run | 2.35@2.50 | 2.35@2.50 | 2.75@2.90 | 2.35@2.50 | 2.35@2.50 | 3.00@3.15 |
| Screenings | 2.05@2.20 | 2.05@2.20 | 2.35@2.50 | 2.05@2.20 | 2.05@2.20 | 2.75@2.90 |
| Washed slack | 2.05@2.20 | 2.05@2.20 | ..... | 2.05@2.20 | 2.05@2.20 | 2.75@2.90 |

## MILWAUKEE

**Official anthracite price schedule received from Washington. A busy week in coal circles. Coal administration force increased.**

Milwaukee has experienced what may properly be termed a coal week, because of a bunching of notable events in connection with the trade; namely, the announcement from Washington of the new local price schedule for anthracite coal; the return of State Fuel Administrator W. N. Fitzgerald from the national capital; the naming of Prof. Stephen W. Gilman, of the University of Wisconsin, as his special assistant; the appointment of C. A. Cahill, of Milwaukee, as state administrative engineer, and a two-day session of the Illinois and Wisconsin Coal Dealers' Convention.

Anthracite prices are considerably higher than the prevailing rates at this time last year. Egg is rated at $10.60, stove at $10.82 and nut at $10.91. No prices have been named on buckwheat, pea and broken coal. During 1917 anthracite prices increased 10c. per ton for three months. This year the entire increase for three months will become effective Sept. 1 and remain in force indefinitely. This ruling is applied to encourage summer buying. The prices named apply to coal delivered at the curb. The cost of carrying in is placed at 50c. per ton and 25c. for less than ton lots.

Wisconsin has also been accorded more coal from southern Illinois and an increase of 8 per cent. in the previous allotment of buckwheat and pea anthracite. It developed that the schedule 86 per cent. anthracite supply covered the larger sizes only. Surplus buckwheat and pea will be sent to the state during the course of the season.

A vigorous campaign in the interest of increased consumption of bituminous coal is to be prosecuted from now on. Mr. Cahill, the new administrative engineer, will devote his attention to devising ways and means for saving fuel in manufacturing plants throughout the state. Counties in the extreme northern and northwestern parts of the state, where wood is abundant, will receive little or no coal.

Stephen D. Balliet, of Appleton, Wis., was chosen president of the Illinois and Wisconsin Retail Dealers' Association; E. C. Streeter, of Grand Fork, Ill., vice-president; O. S. Dodge, of Monroe, Wis., treasurer, and Peter Beck, of Harvey, Ill., and C. H. Hill, of Beloit, Wis., directors. I. L. Runyan, of Chicago, is secretary.

Chippewa Falls, Wis., is now purchasing soft coal for $4.95 per ton delivered in bins. The city contracted for 475 tons at $2.85 at the mines, but this price was reduced on order of the Government.

Coal receipts by lake at Milwaukee continue slow. Since the last report 7500 tons of hard and 62,858 tons of soft coal have reached the docks, making the record since the opening of navigation up to the present time 152,235 tons of hard and 799,541 tons of bituminous.

## ST. LOUIS

**An unusually good market, contrary to expectations. Carterville coal hard to secure. Other coals somewhat easier and Standard inclined to be weak. Steam sizes not moving free. Transportation better. Car supply poor.**

The local situation is encouraging from the fact that the demoralization that was expected to follow the higher rates in view of the large amount of coal put in storage under the low rate did not materialize. Locally the domestic demand has fallen off some, but the orders on the books of the retailers is sufficient to last them for two or three months. The principal trouble locally is the fact that users of high-grade fuels are unable to secure them and are undecided what to take as substitutes. Up to the 27th of May the retailers of St. Louis had booked about 40,000 tons of anthracite coal, none of which will be delivered. To replace this will require about between 90,000 to 100,000 tons of soft coal. These orders have not yet been placed.

It is expected that about 25,000 to 30,000 tons of coke will be available from the local plants in the next eight months, which will take the place to some extent of hard coal, but this demand upon Government instructions for coke distribution. If there are manufacturing plants and public utilities that must have this coke then the domestic consumer will not get it.

Indications are now that there is going to be unusual activity in the retail market in the next three months, and to such an extent that the retailers will not be able to handle the situation with the volume of orders now on hand.

The Carterville situation this week shows a somewhat disappointing tonnage. The car supply has been exceptionally poor, and in a general way there seems to be a decrease in the tonnage available for domestic shipment. It is expected, however, after July 1 there will be a better supply for domestic shipment on account of rumors that the Government has an order prohibiting the railroads from taking this coal for railroad purposes.

In the Mt. Olive field the car supply has been poor the past week, but the tonnage of coal produced is about equal to the demand.

In the Standard field the car supply has been unusually bad and there have been idle days this past week caused by the men laying off to celebrate the departure of the men in the draft. Other mines have been idle on account of no orders.

There is not a good market for Standard coal.

The steam market is unusually weak in places. There is, however, a feeling that this market will improve in the next ten days or two weeks.

There are no Eastern or Arkansas coals moving in.

The St. Louis Fuel Committee established new prices for retail as follows, effective July 1:

Carterville, $6.20; Duquoin, $5.95; Mt. Olive, $5.70, and Standard, $5.45. This is sidewalk delivery, two tons or more.

The price on domestic coke was fixed for June deliveries at $12.50; July, $12.75; August, $13. This on both gashouse and by-product.

There has been no change in the mine price from last week other than that Standard screenings are worth from $1.30 to $1.50 on account of restrictions and Standard 2 in. lump is quoted at from $2.25 to $2.40, with egg and nut at the same figure. Other coals are bringing the Government maximum.

The prevailing market is, per net ton, f.o.b. mines:

| | Williamson and Franklin County | Mt. Olive and Staunton | Standard |
|---|---|---|---|
| 6-in. lump | $2.55@2.70 | $2.55@2.70 | $2.40@2.70 |
| 3x6-in. egg | 2.55@2.70 | 2.55@2.70 | 2.35@2.55 |
| 2x3-in. nut | 2.55@2.70 | 2.55@2.70 | 2.35@2.55 |
| No. 2 nut | 2.55@2.70 | 2.55@2.70 | ..... |
| No. 3 nut | 2.55@2.70 | 2.55@2.70 | ..... |
| No. 4 nut | 2.55@2.70 | 2.55@2.70 | ..... |
| No. 5 nut | 2.05@2.20 | 2.05@2.20 | ..... |
| 2-in. scrgs | 2.05@2.20 | 2.05@2.20 | 1.25@1.50 |
| 2-in. lump | ..... | ..... | 2.25@2.40 |
| 3-in. lump | ..... | ..... | 2.25@2.40 |
| Steam egg | ..... | ..... | 2.25@2.40 |
| Mine run | 2.35@2.50 | 2.35@2.50 | 1.85@2.00 |
| Washed: | | | |
| No. 1 | 2.75@2.90 | 2.75@2.90 | ..... |
| No. 2 | 2.75@2.90 | 2.75@2.90 | ..... |
| No. 3 | 2.55@2.75 | 2.55@2.75 | ..... |
| No. 4 | 2.55@2.75 | 2.55@2.75 | ..... |
| No. 5 | 2.05@2.20 | 2.05@2.20 | ..... |

Williamson and Franklin County rate is $1.10; Duquoin field, $1; Standard and Mt. Olive fields, 95c.

# CURRENT PRICES—MATERIALS & SUPPLIES

## IRON AND STEEL

**STEEL SHEET PILING**—The following price is base per 100 lb. f.o.b. Pittsburgh, with a comparison of a month and a year ago:

| Current | One Month Ago | One Year Ago |
|---|---|---|
| $4–5 | $4–5 | $3.60 |

**PIG IRON**—Below are the present quotations, with a comparison of a month and a year ago:

| | Current | One Month Ago | One Year Ago |
|---|---|---|---|
| CINCINNATI | | | |
| No. 2 Southern foundry | $36.90 | $35.90 | $47.90 |
| No. 2 Northern foundry | ..... | 36.26 | ..... |
| NEW YORK † | | | |
| No. 2 X Northern foundry | 34.40 | 34.25 | 50.25 |
| No. 2 plain Northern foundry | 33.90 | 33.75 | 49.25 |
| No. 2 Southern foundry | 39.00 | 39.00 | 49.25 |
| BIRMINGHAM | | | |
| No. 2 Southern foundry | 33.00 | 33.00 | 45.00 |
| CHICAGO | | | |
| No. 2 Northern foundry | 33.00 | 33.00 | 55.00 |
| No. 2 Southern foundry | 38.00 | 37.00 | ..... |
| PITTSBURGH | | | |
| Bessemer iron * | 36.60 | 36.15 | 55.95 |
| Basic iron * | 32.00 | 32.00 | 50.00 |

* These prices include the freight charge from the valley to the Pittsburgh district. † Delivered Tidewater, New York.

**STRUCTURAL MATERIAL**—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

| | Mill, Pittsburgh | New York—Current | New York—1 Year Ago | St. Louis | Chicago |
|---|---|---|---|---|---|
| Beams, 3 to 15 in. | $3.00 | $4.245 | $5.25 | $4.27 | $4.27 |
| Channels, 3 to 15 in. | 3.00 | 4.245 | 5.25 | 4.27 | 4.27 |
| Angles, 3 to 6 in., ¼ in. thick | 3.00 | 4.245 | 5.25 | 4.27 | 4.27 |
| Tees, 3 in. and larger | 3.05 | 4.245 | 5.25 | 4.27 | 4.27 |
| Plates | 3.225 | 4.745 | 9.00 | 4.52 | 4.52 |

**BAR IRON**—Prices in cents per pound at cities named are as follows:

| Pittsburgh | St. Louis | Denver | Birmingham |
|---|---|---|---|
| 3.50 | 4.17 | 4.05 | 4.38 |

**NAILS**—Prices per keg from warehouse in cities named:

| | Mill Pittsburgh | St. Louis | Denver | Chicago | Birmingham | San Francisco | Dallas |
|---|---|---|---|---|---|---|---|
| Wire | $3.50 | $4.50 | $4.85 | $4.32 | $4.25 | $5.95 | $4.75 |
| Cut | 4.00 | 5.40 | ..... | 4.47 | .... | 6.40 | ..... |

**TRACK SUPPLIES**—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

| | Pittsburgh Current | Cincinnati | Chicago | St. Louis | San Francisco | Birmingham | Denver |
|---|---|---|---|---|---|---|---|
| Standard railroad spikes 9/16-in. and larger | $3.90 | $6.00 | $4.50 | $5.30 | $6.70 | $5.30 | $5.00 |
| Track bolts | 4.90 | 8.90 | 5.50 | Prem. | 8.00 | 8.00 | 6.00 |
| Standard section angle bars | 3.25 | .... | 4.45 | Prem. | 5.15 | .... | 4.30 |

**COLD DRAWN STEEL SHAFTING**—From warehouse to consumers requiring fair-sized lots, the following discounts hold:

| Cincinnati | Cleveland | Chicago | St. Louis | Denver | Birmingham |
|---|---|---|---|---|---|
| 17½% | List | +10% | +10% | +35% | +30% |

**HORSE AND MULE SHOES**—Warehouse prices per 100 lb. in cities named:

| | Mill Pittsburgh | Cincinnati | Chicago | St. Louis | Denver | Birmingham |
|---|---|---|---|---|---|---|
| Straight | $5.25 | $7.50 | $6.50 | $6.25 | $8.00 | $7.50 |
| Assorted | 5.40 | 7.50 | 6.50–7.00 | 6.40 | 8.25 | 7.75 |

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box

**CAST-IRON PIPE**—The following are prices per net ton for carload lots:

| | New York—Current | New York—1-Month Ago | New York—One Year Ago | Chicago | St. Louis | San Francisco |
|---|---|---|---|---|---|---|
| 4 in. | $64.35 | $64.35 | $68.50 | $64.80 | $63.00 | $76.00 |
| 6 in. and over | 61.35 | 61.35 | 65.50 | 61.80 | 60.00 | 73.00 |

Gas pipe and 16-ft. lengths are $1 per ton extra.

**STEEL RAILS**—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

| | Pittsburgh—Current | Pittsburgh—One Year Ago | Chicago—Current | Chicago—One Year Ago |
|---|---|---|---|---|
| Standard Bessemer rails | $57.00 | $38.00 | $67.00 | $38.00 |
| Standard openhearth rails | 55.00 | 40.00 | 65.00 | 40.00 |
| Light rails, 8 to 10 lb. | *3.135 (100 lb.) | 58.00 | *3.135 (100 lb.) | 53.00 |
| Light rails, 12 to 14 lb. | *3.09 (100 lb.) | 57.00 | *3.09 (100 lb.) | 54.00 |
| Light rails, 25 to 45 lb. | *3.00 (100 lb.) | 53.00 | *3.00 (100 lb.) | 52.00 |

* Government price per 100 lb.

**OLD MATERIAL**—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges:

| | New York | Chicago | St. Louis |
|---|---|---|---|
| No. 1 railroad wrought | $30.80 | $33.00 | $34.00 |
| Stove plate | 22.50 | 25.00 | 19.00 |
| No. 1 machinery cast | 34.00 | 29.00 | 21.50–22 |
| Machine shop turnings | 15.30 | 17.50 | 19.00 |
| Cast borings | 15.30 | 17.50 | 18.50 |
| Railroad malleable cast | 30.30 | 29.00 | 25.50–26 |

**COAL BIT STEEL**—Warehouse price per pound is as follows:

| New York | Cincinnati | Birmingham | St. Louis | Denver |
|---|---|---|---|---|
| $0.12 | $0.16½ | $0.18 | $0.18 | $0.17 |

**DRILL STEEL**—Warehouse price per pound:

| | New York | St. Louis | Birmingham |
|---|---|---|---|
| Solid | 15c. | 14c. | 15c. |
| Hollow | 24c. | 25c. | .... |

**PIPE**—The following discounts are for carload lots f.o.b. Pittsburgh; basing card of Nov. 6, 1917, for steel pipe and for iron pipe:

BUTT WELD

| Steel Inches | Black | Galvanized | Iron Inches | Black | Galvanized |
|---|---|---|---|---|---|
| ⅛, ¼ and ⅜ | 44% | 17% | ½ to 1¼ | 33% | 17% |
| ½ | 48% | 33⅓% | | | |
| ¾ to 3 | 51% | 37½% | | | |

LAP WELD

| | | | | | |
|---|---|---|---|---|---|
| 2 | 44% | 31⅓% | 2 | 26% | 12% |
| 2½ to 6 | 47% | 34⅓% | 2½ to 4 | 28% | 15% |
| | | | 4½ to 6 | 28% | 15% |

BUTT WELD. EXTRA STRONG PLAIN ENDS

| | | | | | |
|---|---|---|---|---|---|
| ⅛, ¼ and ⅜ | 40% | 22½% | ½ to 1¼ | 33% | 18% |
| ½ | 45% | 36½% | | | |
| ¾ to 1¼ | 49% | 36½% | | | |

LAP WELD. EXTRA STRONG PLAIN ENDS

| | | | | | |
|---|---|---|---|---|---|
| 2 | 42% | 30½% | 2 | 27% | 14% |
| 2½ to 4 | 45% | 33½% | 2½ to 4 | 29% | 17% |
| 4½ to 6 | 44% | 32½% | 4½ to 6 | 28% | 16% |

From warehouses at the places named the following discounts hold for steel pipe:

| | Black—New York | Black—Chicago | Black—St. Louis |
|---|---|---|---|
| ⅜ to 3 in. butt welded | 33% | 39% | 40.1% |
| 3½ to 6 in. lap welded | 15% | 43% | 36.1% |
| | **Galvanized—New York** | **Galvanized—Chicago** | **Galvanized—St. Louis** |
| ⅜ to 3 in. butt welded | 16% | 28% | 25.1% |
| 3½ to 6 in. butt welded | +3 | 25% | 22.1% |

Malleable fittings. Class B and C, from New York stock sell at list price. Cast iron, standard sizes, 5%.

## SHOP SUPPLIES

**NUTS**—From warehouse at the places named, on fair sized orders, the following amount is deducted from list:

| | New York—Current | New York—One Year Ago | Cleveland—Current | Cleveland—One Year Ago | Chicago—Current | Chicago—One Year Ago |
|---|---|---|---|---|---|---|
| Hot pressed square | $2.50* | List | $1.40 | $1.65 | $1.05 | $3.00 |
| Hot pressed hexagon | 2.50* | List | 1.20 | 1.50 | .85 | 3.00 |
| Cold punched square | 2.50* | List | .75 | 1.40 | 1.00 | 1.75 |
| Cold punched hexagon | 2.50* | List | .75 | 1.40 | 1.00 | 2.25 |

* List plus.

Semifinished nuts sell at the following discounts from list price:

| | Current | One Year Ago |
|---|---|---|
| New York | 40% | 50% |
| Chicago | 50% | 50% |
| Cleveland | 60% | 50% |

**MACHINE BOLTS**—Warehouse discounts in the following cities:

| | New York | Cleveland | Chicago |
|---|---|---|---|
| ⅜ by 4 in. and smaller | 30% | 46% | 37% |
| Larger and longer up to 1 in. by 30 in. | 15% | 40% | 25—5% |

**WASHERS**—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:

New York..... $2.50 Cleveland..... $3.00 Chicago..... $2.50

For cast-iron washers the base price per 100 lb. is as follows:

New York..... $3.50 Cleveland..... $4.00 Chicago..... $3.50

**RIVETS**—The following quotations are allowed for fair-sized orders from warehouse:

| | New York | Cleveland | Chicago |
|---|---|---|---|
| Steel 7/16 and smaller | 30% | 45—5% | 45%* |
| Tinned | 30% | 45—5% | 45%* |

Button heads, ⅜, ½; 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:

New York..$6.14½ Cleveland...$5.15 Chicago ...$5.50 Pittsburgh...$4.65

Coneheads, same sizes:

New York..$6.24½ Cleveland...$5.25 Chicago....$5.60 Pittsburgh..$4.75

## MISCELLANEOUS

**GREASES**—Prices are as follows in the following cities in cents per pound for barrel lots:

| | Cincinnati | St. Louis | Birmingham | Denver | Pittsburgh |
|---|---|---|---|---|---|
| Cup | 7 | 13.0 | 7½ | 12 | 7½ |
| Fiber or sponge | 8 | 13.0 | 7½ | 20 | 7½ |
| Transmission | 7 | 13.0 | 7½ | 20 | 7½ |
| Axle | 4½ | 3.8 | 5¼ | 5¼ | 4 |
| Gear | 4½ | 7.0 | 4½ | 9 | 4 |
| Car journal | 22 (gal.) | 4.3 | 7½ | 8 | 4 |

**BABBITT METAL**—Warehouse prices in cents per pound:

| | New York | | Cleveland | | Chicago | |
|---|---|---|---|---|---|---|
| | Current | One Year Ago | Current | One Year Ago | Current | One Year Ago |
| Best grade | 125.00 | 70.00 | 113.00 | 70.00 | 100.00 | 70.00 |
| Commercial | 70.00 | 70.00 | 23.00 | 24.00 | 24.00 | 30.00 |

**HOSE**—Following are prices of various classes of hose:

| | Fire |
|---|---|
| | 50-Ft. Lengths |
| Underwriters' 2½-in | 75c. per ft. |
| Common, 2½-in | 40% |

| | Air | | |
|---|---|---|---|
| | First Grade | Second Grade | Third Grade |
| ¾-in. per ft | $0.55 | $0.30 | $0.25 |

Steam—Discounts from list

First grade 30% Second grade 30–5% Third grade 40–10%

**LEATHER BELTING**—Present discounts from list in cities named:

| | Medium Grade | Heavy Grade |
|---|---|---|
| St. Louis | 40+5% | 35% |
| Denver | 35% | 30% |
| Birmingham | 30% | 35% |
| Chicago | 45% | 40% |
| Cincinnati | 40—10% | 40% |

**RAWHIDE LACING**—40—5% off list.

**PACKING**—Prices per pound:

| | |
|---|---|
| Rubber and duck for low-pressure steam | $0.99 |
| Asbestos for high-pressure steam | 1.76 |
| Duck and rubber for piston packing | 1.10 |
| Flax, regular | .99 |
| Flax, waterproofed | 1.21 |
| Compressed asbestos sheet | 1.10 |
| Wire insertion asbestos sheet | 1.30 |
| Rubber sheet | .66 |
| Rubber sheet, wire insertion | .99 |
| Rubber sheet, duck insertion | .55 |
| Rubber sheet, cloth insertion | .25 |
| Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes | 1.21 |
| Asbestos wick, ¾- and 1-lb. balls | .75 |

**WIRE ROPE**—Discounts from list price on regular grades of bright and galvanized are as follows:

| | New York and St. Louis |
|---|---|
| Galvanized iron rigging | +20% |
| Galvanized cast steel rigging | List |
| Bright plain rigging | 30% |
| Bright cast steel | 17½% |
| Bright iron and iron tiller | 5% |

**MANILA ROPE**—For rope smaller than ¾-in. the price is ½ to 2c. extra; while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ½-in., 8 ft.; ¾-in., 6; ¾-in., 4½; 1 in., 3½; 1¼-in., 2 ft. 10 in.; 1½-in., 2 ft. 4 in. Following is price per pound for ¾-in. and larger, in 1200-ft. coils:

| | | | |
|---|---|---|---|
| Boston | $0.34 | Birmingham | $0.38 |
| New York | .33 | Denver | .35½ |
| Cincinnati | .33½ | Kansas City | .34 |
| Chicago | .34 | Seattle | .34 |
| St. Paul | .34 | St. Louis | .34 |
| San Francisco | .32 | Los Angeles | .35 |

**PIPE AND BOILER COVERING**—Below are discounts and part of standard lists:

| PIPE COVERING | | BLOCKS AND SHEETS | |
|---|---|---|---|
| Pipe Size | Standard List Per Lin. Ft. | Thickness | Price per Sq. Ft. |
| 1-in. | $0.27 | ½-in. | $0.27 |
| 2-in. | .36 | 1 -in. | .30 |
| 6-in. | .80 | 1½-in. | .45 |
| 4-in. | .60 | 2 -in. | .60 |
| 3-in. | .45 | 2½-in. | .75 |
| 8-in. | 1.10 | 3 -in. | .90 |
| 10-in. | 1.30 | 3½-in. | 1.05 |
| 85% magnesia high pressure | | | 15% off |
| For low-pressure heating and return lines | | 4-ply | 58% off |
| | | 3-ply | 60% off |
| | | 2-ply | 62% off |

**LINSEED OIL**—These prices are per gallon:

| | New York | | Cleveland | | Chicago | |
|---|---|---|---|---|---|---|
| | Current | One Year Ago | Current | One Year Ago | Current | One Year Ago |
| Raw in barrel | $1.65 | $1.31 | $1.75 | $1.32 | $1.70 | $1.32 |
| 5-gal. cans | 1.75 | 1.41 | 1.90 | 1.42 | 1.80 | 1.37 |

* Nominal.

**WHITE AND RED LEAD** in 500-lb. lots sell as follows in cents per pound:

| | Red | | | White | | |
|---|---|---|---|---|---|---|
| | Current | | 1 Year Ago | Current | | 1 Year Ago |
| | Dry | In Oil | Dry | In Oil | Dry and In Oil | Dry and In Oil |
| 25 and 50-lb. kegs | 12.38 | 12.83 | 13.25 | 13.50 | 12.38 | 13.00 |
| 12½-lb. keg | 12.60 | 13.05 | 13.50 | 13.50 | 12.60 | 13.25 |
| 100-lb. keg | 12.15 | 12.29 | 13.75 | 14.00 | 12.15 | 13.00 |
| 5-lb. cans | 13.95 | ..... | 15.25 | 15.50 | 13.95 | 15.00 |
| 1-lb. cans | 14.85 | ..... | ..... | ..... | 14.85 | ..... |

**COMMON BRICK**—The prices per 1000 in cargo or carload lots are as follows:

| | | | |
|---|---|---|---|
| Cincinnati | $12–15.50 | Birmingham | $13.75 |
| St. Louis | 12.00 | Denver | 9.50 |

**WIRING SUPPLIES**—New York prices for tape and solder are as follows:

| | |
|---|---|
| Friction tape, ¾ lb. rolls | 38c. per lb. |
| Rubber tape, ¼-lb. rolls | 45c. per lb. |
| Wire solder, 50-lb. pools | 46c. per lb. |
| Soldering paste, 2-oz. cans | $1.20 per doz. |

**PREPARED ROOFINGS**—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco.

| | 1-Ply | | 2-Ply | | 3-Ply | |
|---|---|---|---|---|---|---|
| | C.l. | L. C.l. | C.l. | L.C.l. | C.l. | L.Cl. |
| No. 1 grade | $1.30 | $1.55 | $1.60 | $1.75 | $1.90 | $2.05 |
| No. 2 grade | 1.15 | 1.30 | 1.45 | 1.60 | 1.75 | 1.90 |

Asbestos asphalt saturated felt (14 lb. per square) costs $5.35 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $1.95 per roll in carload lots and $2.20 for smaller quantities.

Shingles, red and green slate finish cost $5.25 per square in carloads, $5.50 in smaller quantities, in Philadelphia.

**ROOFING MATERIALS**—Prices per ton f.o.b. New York or Chicago:

| | Carload Lots | Less than Carload Lots |
|---|---|---|
| Tarfelt (14 lb. per square of 100 sq. ft.) | 64 | 65 |
| Tar pitch (in 400-lb. bbl.) | 21 | 22 |
| Asphalt pitch (in barrels) | 37 | 42 |
| Asphalt felt | 72.50 | 77.50 |

**HOLLOW TILE**—The price per 1000 in carload lots f.o.b. mine is as follows:

| | 4 x 12 x 12 | 8 x 12 x 12 |
|---|---|---|
| St. Louis | $60.80 | $114.00 |
| Chicago | 79.00 | 137.00 |
| Denver, per ton | None | None |
| Kansas City | 75.00 | 140.00 |
| St. Paul | 56.00 | 110.00 |
| Boston | 80.00 | 150.00 |
| Birmingham | 70.00 | 131.75 |
| Cincinnati | 69.00 | 129.00 |
| Pittsburgh | 86.50 | 147.10 |

**LUMBER**—Price of yellow pine per M in carload lots:

| | 1-in. Rough 10 In. x 16 Ft. | 2-In. T. and G. 10 In. x 16 Ft. | 8 x 8 In. x 20 Ft. |
|---|---|---|---|
| St. Louis | $40.00 | $31.00 | $38.00 |
| Birmingham | 30.00 | 34.00 | 33.00 |
| Denver | 40.00 | 42.00 | 42.50 |
| Cincinnati | 45.00 | 44.00 | 39.00 |

**STEEL SHEETS**—The following are the prices in cents per pound from jobbers' warehouse at the cities named:

| | Pittsburgh, Mill, in Carloads | New York | | | Cleveland | | Chicago | |
|---|---|---|---|---|---|---|---|---|
| | | Current | One Month Ago | One Year Ago | Current | One Year Ago | Current | One Year Ago |
| *No. 28 black | 5.00 | 6.495 | 6.445 | 10.00 | 6.42 | 9.50 | 6.52 | 9.50 |
| *No. 26 black | 4.90 | 6.395 | 6.345 | 9.90 | 6.32 | 9.40 | 6.42 | 9.40 |
| *Nos. 22 and 24 black | 4.85 | 6.345 | 6.295 | 9.85 | 6.27 | 9.35 | 6.37 | 9.35 |
| Nos. 18 and 20 black | 4.80 | 6.295 | 6.245 | 9.80 | 6.22 | 9.30 | 6.32 | 9.30 |
| No. 16 blue annealed | 4.45 | 5.695 | 5.645 | 9.70 | 5.62 | 9.70 | 5.72 | 9.70 |
| No. 14 blue annealed | 4.35 | 5.595 | 5.545 | 9.60 | 5.52 | 9.60 | 5.62 | 9.60 |
| No. 10 blue annealed | 4.25 | 5.495 | 5.445 | 9.50 | 5.42 | 9.50 | 5.52 | 9.50 |
| *No. 28 galvanized | 6.25 | 7.745 | 7.695 | 13.00 | 7.67 | 11.00 | 7.77 | 11.00 |
| *No. 26 galvanized | 5.95 | 7.445 | 7.395 | 12.70 | 7.37 | 10.70 | 7.32 | 10.70 |
| No. 24 galvanized | 5.80 | 7.295 | 7.245 | 12.55 | 7.22 | 10.55 | 7.47 | 10.55 |

* For painted corrugated sheets add 30c. per 100 lb. for 25 to 28 gage; 25c. for 19 to 24 gages; for galvanized corrugated sheets add 5c., all gages

**COPPER WIRE**—Prices per 1000 ft. for rubber-covered wire in following cities:

| | Denver | | | St. Louis | | | Birmingham | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | Single Braid | Double Braid | Duplex | Single Braid | Double Braid | Duplex | Single Braid | Double Braid | Duplex |
| 14 | $11.40 | $13.40 | $31.00 | $11.00 | $20.00 | $31.50 | $11.00 | $17.90 | $36.60 |
| 10 | 22.15 | 25.25 | 50.05 | 25.40 | 29.00 | 59.00 | 30.30 | 34.30 | 48.80 |
| 8 | 31.40 | 24.25 | 69.50 | 35.45 | 35.00 | 72.50 | 42.35 | 46.85 | 67.60 |
| 6 | 49.40 | 53.30 | ..... | ..... | 61.00 | 120.00 | 64.60 | 74.10 | ..... |
| 4 | 71.30 | 76.15 | ..... | ..... | 86.00 | ..... | 101.75 | 106.55 | ..... |
| 2 | 108.00 | 113.65 | ..... | ..... | 130.00 | ..... | 151.50 | 163.00 | ..... |
| 1 | 140.40 | 147.85 | ..... | ..... | 176.00 | ..... | 201.00 | 209.50 | ..... |
| 0 | 176.85 | 176.85 | ..... | ..... | 222.00 | ..... | 276.00 | 285.00 | ..... |
| 00 | ..... | 239.45 | ..... | ..... | 270.00 | ..... | 317.00 | 330.00 | 67.60 |
| 000 | ..... | 298.15 | ..... | ..... | 330.00 | ..... | 417.00 | 428.00 | ..... |
| 0000 | ..... | 357.00 | ..... | ..... | 400.00 | ..... | 508.00 | 516.00 | ..... |

**EXPLOSIVES**—Price per pound of dynamite in small lots and price per 25-lb keg for black powder:

| | Low Freezing | Gelatin | | | Black |
|---|---|---|---|---|---|
| | 20% | 40% | 60% | 80% | Powder |
| New York | ..... | $0.27½ | $0.34½ | ..... | $2.40 |
| Boston | $0.24½ | .27½ | .34½ | $0.41½ | 2.40 |
| Cincinnati | .18¾ | .22½ | .27½ | ..... | 2.25 |
| Kansas City | .20 | .26½ | .33½ | .43½ | 2.45 |
| Seattle | .17½ | .29½ | .31½ | .41½ | ..... |
| Chicago | .18½ | .22½ | .33 | .43 | 2.35 |
| St. Paul | .19 | .23 | .28 | .43½ | 2.75 |
| St. Louis | .19 | .26½ | .33½ | .43½ | 2.35 |
| Denver | .18 | .25½ | .32½ | .42½ | 2.45 |
| Dallas | .23 | .30½ | .37½ | .47½ | ..... |
| Los Angeles | .22 | .28 | .36 | ..... | ..... |
| San Francisco | .17½* | .23½* | .30½* | .40½* | ..... |

* Carload lots.

**FREIGHT RATES**—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc., the following freight rates per 100 lb. are effective:

| | | | |
|---|---|---|---|
| Boston | $0.27 | New Orleans | $0.385 |
| Buffalo | .17 | New York | .245 |
| Chicago | .27 | Philadelphia | .23 |
| Cincinnati | .23 | St. Louis | .34 |
| Cleveland | .17 | St. Paul | .495 |
| Denver | .99 | Pacific Coast (all rail) | 1.25 |
| Kansas City | .59 | | |

Note—Add 3% transportation tax.